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"Scire est nescire, nisi id me
Scire alius sciret."

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THE LONG FOX LECTURE:

THE FIFTH ANNUAL LECTURE ARRANGED BY THE COMMITTEE OF THE LONG FOX MEMORIAL,
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BY

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ON

METASTATIC INFLAMMATIONS OF THE EYE.

MY first duty is the pleasant one of thanking you for the honour you have done me in electing me to give the fifth lecture in this series. My personal acquaintance with Dr. Long Fox was slight, but it appeared to me, even in those early days, that no one could fail to be struck with his geniality, his intellectual superiority, and the high purpose which ruled his life. It is not

surprising that you should desire to perpetuate his beneficent influence, and those who are called upon to deliver this lecture cannot fail to be stimulated to approach as near as may be to his ideal, and thus fulfil your intentions.

I have chosen for my subject "Metastatic or Endogenous Inflammations of the Eye," by which I mean inflammations of the eye due to bacteria or toxins which are derived from a source in some other part of the body. It will be at once appreciated that the subject is very wide in its scope, and includes a number of well-known diseases of the eye. Time will not permit me to review these exhaustively, and I shall use them only as a safe starting-point, and for the illustrations they supply of important general deductions which may be reasonably accepted. I do not propose to include (under the term *metastatic*) transmission by direct continuity, though in cases where the meninges of the brain are affected it is not always easy to eliminate this mode. Two other paths are open, by the lymph and blood streams. Of these, the former is rare, and in most cases we shall have to deal with blood transmission.

It will be convenient to take ocular tuberculosis as a typical form of metastatic inflammation. Clinically it can generally be recognised with certainty, and the diagnosis is usually placed beyond doubt if microscopic examination is feasible. Tubercle almost invariably attacks some part of the uveal tract, either the iris, ciliary body or choroid. It is probable that the retina is never affected primarily, and only a few cases of tubercle of the optic nerve head are on record. One such case came under my care at Great Ormond Street Children's Hospital, and has been reported by Mr. Coats.[1] This peculiarity of anatomical distribution introduces one of the main points upon which I wish to lay stress, viz. *the selectivity of site in metastatic inflammation of the eye.*

As regards tubercle of the iris, there is the possibility of direct transmission from the cornea or conjunctiva. Some time ago I inoculated the corneæ of rabbits with a virulent culture of tubercle bacilli. In no case was tubercle of the iris caused unless the anterior chamber was penetrated. Indeed, tubercle

of the cornea is produced with extreme difficulty experimentally, and primary tubercle of the cornea is excessively rare clinically. Much discussion has arisen as to whether tubercle of the iris is primary or secondary. The matter need not detain us now, since it matters little for the aspect from which we are considering the subject whether the iridic is the first focus of deposition or a secondary one ; in either case the inflammation is endogenous in origin and due to blood transmission.

A very striking example of the selective action of organisms on the tissues is found in gonorrhœa. Gonorrhœal iritis is much commoner than was at one time supposed. It may occur during the acute attack of urethritis, the exudates into the anterior chamber having then a peculiar gelatinous appearance, or it occurs as a form of recurrent iritis. In the latter variety it seldom supervenes until after an attack of arthritis, usually in the knees, and it is nearly always associated with gonorrhœal " rheumatism." Thus, gonorrhœal rheumatism and iritis are both manifestations of metastatic deposits of gonococci in the tissues of distant organs. It is well known that gonococci remain virulent in the body for a long time after the acute attack. In the recurrent form of gonorrhœal iritis it is probable that they become encapsuled, lying quiescent for months or years and wakening into activity as the result of trauma or intercurrent inflammation of a different origin. An interesting experiment by Stock[2] may be mentioned in this connection. He found that the transference of a completely healed tuberculous iris from a blood infection in a rabbit to a second rabbit produced severe tuberculosis. As might be anticipated from their anatomical and physiological continuity and similarity, inflammation of one part of the uveal tract is very likely to spread to another. Indeed, it is probably rare for one part to be affected alone. Thus an iritis is nearly always, if not always, accompanied by some cyclitis, and *vice versa*. Often the whole uveal tract seems to suffer simultaneously and equally. Cyclitis as an accompaniment of choroiditis is probably more frequent than we have been accustomed to think. It is somewhat remarkable, therefore, that gonorrhœal iritis rarely spreads in any great degree to the ciliary body, and that the

choroid is almost never affected. This shows a striking selective influence of the various tissues by the organisms. It may be explained by supposing, in the terms of Ehrlich's theory, that certain tissues are particularly rich in appropriate receptors for specific organisms, and that these receptors may be completely absent in other tissues.

The same selection of the iris was shown by an extremely virulent strain of streptococci in a case of septicæmia which came under my observation at Great Ormond Street. The following is a brief abstract of the notes :—

Beatrice C. was admitted to the Children's Hospital on July 14th, 1908, under the care of Mr. Fairbank, with a temperature of 103°. There had been a discharge from the left ear for four years. On admission there was a fluctuating swelling over the left mastoid. On the same day Mr. Fairbank did a complete mastoid operation. The antrum was full of pus. The lateral sinus was exposed but not opened. The abscess was drained through a counter opening in the posterior triangle. The temperature continued high and irregular. On July 18th, the mastoid was cut away posteriorly, the internal jugular vein ligatured, and the lateral sinus opened and packed with gauze. It was not thrombosed. The temperature continued remittent, rising to 103°. The left optic disc appeared slightly blurred. On July 23rd cultures were taken from the blood ; they showed the presence of pure streptococci. More bone was removed posteriorly, but nothing was discovered. On July 24th the lateral sinus was opened up and washed through from the jugular vein, a considerable quantity of pus being evacuated. The eyes had been repeatedly examined, but no definite neuritis could be made out. On this day several flakes of lymph were seen upon the left iris. On July 25th the cornea was steamy, there was intense iritis with much ciliary injection. The fundus could not be seen. Atropine was ordered. The right disc looked normal. There was no proptosis of the left eye. The left side of the body was paretic. The skull was trephined, and the cerebrum and cerebellum both explored, but only clear fluid was obtained. Examination of cerebro-spinal fluid showed equal numbers of lymphocytes and polymorphonuclear leucocytes : it was sterile. Cultures from the mastoid wound showed staphylococcus aureus. On July 26th the left eye was still more inflamed and the conjunctiva was chemosed. The child was becoming unconscious, and nasal feeding was commenced. On July 27th the left cornea was like ground glass. The lids were separated owing to the chemosis, but there was no proptosis. The right disc looked normal, but

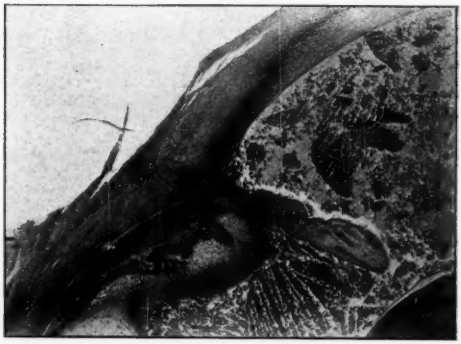

Fig. 1.

Fig. 2.

Fig. 3.

Case of B. C.—*Metastatic Inflammation of the Eye.*

there were punctate hemorrhages in the retina above the disc. On July 28th the legs and arms, up to now flaccid, became more rigid. Urine and fæces were voided involuntarily. The right disc was blurred, but there was not much swelling. On July 29th the child was comatose; temperature 105–6°; respirations 46. Some sloughing of scalp in right temporal region. Right optic neuritis marked, and many retinal hemorrhages, distributed along the vessels. The patient died on July 31st.

Post-mortem Examination.—The left jugular vein contained septic thrombus as high as the horizontal part of the lateral sinus. The left inferior petrosal sinus contained septic clot. The left superior petrosal and cavernous sinuses were not thrombosed. All the sinuses on the right side were normal. There was a small abscess in the *right* uncus. Right temporo-sphenoidal lobe softened Brain congested, no meningitis. No thrombosis of cerebral veins. There was a small broken-down septic infarct in the upper lobe of the right lung. Heart, prominent vegetations on the mitral valve. Left kidney, enormous infarct involving the whole of the upper part. Liver, fatty. Spleen, slightly enlarged (it was easily palpable when the child was admitted).

The eyes were hardened in 10 per cent. formol.

I am indebted to Mr. G. Coats for kindly preparing sections and photographs. (Figs. 1 to 3.)

Left Eye.—Cornea necrotic. It is denuded of epithelium. possible largely a *post-mortem* effect. Bowman's membrane is intact. The substantia propria is infiltrated with polymorphonuclear leucocytes, which fill the interlamellar spaces of the periphery. Towards the centre of the cornea only the anterior spaces are infiltrated, and the amount of infiltration diminishes from the periphery towards the centre. In the posterior part of the centre of the cornea there are no stained nuclei, so that we may conclude that the corneal corpuscles are dead, and that the greater part of the cornea is necrosed. The infiltration at the periphery is densest around the canal of Schlemm. Here the corneo-scleral structures are entirely masked by the deeply-stained nuclei of the polymorphonuclear leucocytes. (Fig. 1.)

The iris is necrotic. At the periphery it is densely infiltrated with leucocytes. The inner half towards the pupil is little infiltrated, but the nuclei of the stroma cells are unstained. The posterior surface of the iris is becoming denuded of the retinal pigment epithelium. (Fig. 2.)

The anterior chamber is filled with a coagulum which contains an enormous number of leucocytes in various stages of degeneration. Patches show scarcely any nuclear staining, whilst other patches stain feebly. The angles of the chamber are filled with well-stained leucocytes.

The ciliary body is intensely inflamed but not necrotic, for the nuclei of its structural cells stain well. It is covered with a

purulent exudation which pervades the vitreous. Throughout the vitreous the exudation is composed of a fibrinous network. Leucocytes are sparse everywhere except around the circle of the ciliary body, where they stain fairly well. The retinal epithelium covering the ciliary processes shows signs of desquamation. A considerable part of the suspensory ligament has disappeared, the fibres having been absorbed. The broken ends of the fibres are seen, their attachments to the ciliary body being intact.

The lens is commencing to become cataractous, the peripheral fibres, chiefly at the equator and posterior pole, being broken up into globules.

The retina and choroid show remarkably little infiltration, though the former is much congested.

The optic nerve is œdematous, but not infiltrated at all, and the arachnoid of the vaginal space is very little infiltrated, and that only near the eye. Posteriorly the nerve and its coverings look quite normal.

Sections stained for micro-organisms showed the presence of large numbers of streptococci. (Fig. 3.) These were most numerous, and best stained in the neighbourhood of the periphery of the iris, and in the angles of the anterior chamber. Streptococci were present in the exudation on the ciliary body, but here they were scanty, and showed signs of degeneration by staining feebly. In the posterior part of the eye no organisms were seen.

Right Eye.—The anterior part of the right eye is normal. The optic nerve head is swollen and œdematous, without much infiltration. It thus shows the signs of papillœdema or choked disc, rather than those of a true optic neuritis. It is probable that the swelling is due rather to intracranial pressure than to infective inflammation. The condition of the left disc confirms this view. It must be stated, however, that the arachnoid of the right optic nerve shows more signs of infiltration, extending farther back along the nerve, than that of the left, and the vaginal space is more dilated.

It will be seen that in this case the primary seat of metastasis was undoubtedly the iris. Metastatic iritis is not uncommon in experimental intravenous injection of streptococci in animals, but bacterial emboli in other parts of the uveal tract are also frequently found. We may bear in mind here the cases of so-called "rheumatic iritis" obtained in rabbits occasionally by Poynton and Paine[3] after intravenous injection of the diplococcus rheumaticus. This iritis resembles in every respect a septic iritis in its intense virulence, and does not in the slightest degree resemble the iritis which we are clinically accustomed loosely to call rheumatic.

Tubercle affects the choroid in two forms, miliary and conglomerate or solitary. The former is an almost constant accompaniment of the late stages of acute general tuberculosis and of tuberculous meningitis. In the last-mentioned disease, though miliary tubercles are often found *post-mortem* studding the sheath of the optic nerve, the choroidal affection must be regarded as a true metastasis. The posterior part of the nerve is always most involved, and no continuity with the choroidal disease can be demonstrated. Moreover, in most cases the nerve and its sheaths are free from deposits. The same fact is true of endophthalmitis occurring in the course of pneumococcic meningitis, as shown by Axenfeld,[4] and in a case of traumatic streptococcic meningitis reported by de Lieto Vollaro.[5] According to Axenfeld, there is no proved case of transmission by the nerve sheath as suggested in certain cases (Saltini, Silcock, Treacher Collins,[6] and others).

Conglomerate tubercle of the choroid is of particular importance in the clinical diagnosis of metastatic endophthalmitis. It is not very uncommon to meet with cases in which in some part of the fundus a billowy white mass of exudate obscures the normal structures. It has been customary, though on insufficient grounds, to regard these as cases of conglomerate tubercle, which they much resemble in ophthalmoscopic appearances. The condition, however, not infrequently occurs in adults, and, unlike tubercle, gradually subsides, leaving a scarred area behind. It is true that undoubted tubercle occasionally, though rarely, follows a similar course, as has been shown notably in two cases reported by Jessop.[7] In a somewhat allied group of cases an area of retina is separated from the choroid by exudate ; the irregularly prominent retina is œdematous and white, and the retinal vessels in the neighbourhood, especially distal to the area, are often profoundly diseased. One of these cases, under the care of Mr. Marcus Gunn, was reported by Paton[8] as a case of doubtful tubercle. At a later stage I had the opportunity of examining it microscopically.[9] It was possible to state definitely that it was not tuberculous, but the exact nature was somewhat problematic. Recently Coats has examined microscopically several such cases, and has collected others from the literature. They will shortly be published in the

Royal London Ophthalmic Hospital Reports.[10] He favours the view that they are due to subretinal hemorrhage, and I have little doubt that this is the correct explanation in many cases. There is reason, however, to think that other such cases, distinguished from them with difficulty clinically or not at all, are due to metastatic inflammation of a low grade of virulence.

In the condition described by Roth[11] as retinitis septica, white oval spots of considerable size, with or without hemorrhages, occur in the retina, usually not far from the disc. Such spots may be seen in anæmia, leukæmia, diabetes, &c., but are seen in their characteristic form in septicæmic conditions. It is quite certain that they occur in some cases of true metastatic retinitis, as recorded by Axenfeld and Goh,[12] and by Grunert.[13] Axenfeld and Goh's case is particularly important. The patient died. One eye had gone on to suppurative panophthalmitis, and was lost; the other, less affected, contained inflammatory nodules in the retina and choroid. These deposits contained masses of pneumococci, which showed degenerative changes, staining badly, and in other retinal patches had disappeared. Grunert and v. Michel found masses of streptococci in similar patches. Cases of staphylococcic infection leading to changes in the fundus with spontaneous resolution are reported by Holmes Spicer[14] and Schanz.[15] Spicer's cases showed the variability of results from a similar cause. In one there was a retinal abscess, in another retinal phlebitis, in another a local detachment of retina, all due to staphylococcic metastasis from boils. He also recorded a case of retinal phlebitis and local keratitis profunda, due to ptomaine poisoning. Probably a case which I saw, and which has been published by Pernet,[16] comes under the same category. The woman, aged 28, had acquired syphilis. During the secondary stage she complained of bad sight. The retinæ were œdematous, and the vitreous of each eye full of exudates. There was a yellowish reflex, and an hypopyon appeared in the right eye. After prolonged treatment with antisyphilitic remedies, the vision in each eye became almost normal. In this case it is certain that the ocular inflammation was endogenous, and it is unlikely that it was due to syphilis uncomplicated by a septic process.

The pneumococcic cases emphasise another feature of metastatic inflammation of the eye upon which I wish to lay special stress, viz. *the strong tendency for endogenous bacterial metastasis to undergo spontaneous resolution.* We know that pneumococci are amongst the most dangerous organisms which attack the eye. They are responsible for hypopyon ulcer, and for a large number of cases of panophthalmitis, notably those following intraocular operation in the presence of a lacrymal mucocele. Thus, if virulent pneumococci are introduced into the vitreous from outside the body, suppurative retinitis rapidly supervenes, spreads to other parts of the eye, and the eye is inevitably lost from panophthalmitis. On the other hand, pathogenic organisms introduced into the blood stream encounter adverse circumstances which lead to their obliteration or attenuation. They have to fight against the normal protective mechanism, which is actually reinforced by virtue of their presence. Hence, though the organisms may be victors in the long run, they have to run the gauntlet of fierce opposition. In the tissues they have to fight another battle with the local protective mechanism. I have already laid stress upon the predilection of given organisms for specific tissues. It may be that this is merely a ruse of the protective mechanism. Possibly only those tissues which contain the specific receptors for the given organism possess the capacity for manufacturing the corresponding anti-bodies. However that may be, it is certain that virulent organisms deposited in the eye by the blood stream become attenuated and liable to die out. Hence we must not conclude that because spontaneous inflammation tends to resolve itself it must necessarily have been due to toxins, and that bacteria are not present. We have every reason to believe now that virulent pyogenic organisms, brought to the eye by the blood stream, may fail to cause suppuration, and merely set up a sub-acute or chronic plastic inflammation. It is clear that this fact is one of very great significance.

I have instanced the predilection of the tubercle bacillus for the uveal tract. Other organisms, such as the pneumococcus, staphylococcus, often the streptococcus, &c., show a preference for the retina. This is particularly so when, as is often the case,

both eyes are affected. In unilateral metastasis embolic affection of the uvea is frequent. The prevalence of retinal infection cannot be accounted for by special narrowness of the capillaries, for those of the uveal tract are equally small (Sattler). Moreover, in rabbits there is no predisposition for the vascular part of the retina to be specially affected. Stock always obtained uveal metastases, never retinal, from intravenous injections of bacillus pyocyaneus in rabbits. Even with tubercle he found that virulent cultures oftener produced slight lesions in the choroid than in the iris or ciliary body. He attributed this to encapsulation of the bacilli. It is interesting to note that previous injury to the eye in rabbits and cats by cauterisation, foreign body, &c., increases the tendency to metastatic deposits with organisms of slight virulence.

Metastatic ophthalmia was far commoner in the days when puerperal fever and pyæmia were rife, and was much more frequent in the former than in the latter disease. In both streptococci are usually the cause, but the streptococci of puerperal fever seem to have a special affinity for the eye (Axenfeld). Cryptogenetic cases, or those in which a primary focus cannot be discovered, are probably often due to lesions in the gastro-intestinal tract (cf. Holmes Spicer). This is shown by the fact that typhoid bacilli and bacterium coli have been found. Pneumococci are much commoner in cryptogenetic cases than in puerperal or pyæmic. The meningococcus intracellularis of Weichselbaum has been found several times. The organism disappears quickly from the eye, so that it is probably not infrequently missed.

One example of undoubted metastatic inflammation of the eye is found in so-called pseudoglioma. The condition is thus designated because of the resemblance to glioma retinæ ; indeed, they may be indistinguishable clinically. Pseudoglioma may be due to a congenital malformation, to conglomerate tubercle, or to metastatic iridocyclitis. In the last form there is often the history of convulsions, acute specific fever, or some other illness. Often the ocular inflammation produces so little outward manifestation that it is noticed only long after the illness, or there may be no history of illness at all. The child is usually brought for

examination for the same reason as in glioma, viz. a yellow reflex through the pupil (amaurotic cat's eye). This yellow reflex in these cases is caused by a cyclitic membrane behind the lens, the retina being also often detached. More minute investigation will frequently demonstrate signs of old iridocyclitis—posterior synechiæ, deep anterior chamber, pigment on the lens capsule, softening of the eye, &c. There can be little doubt that these cases are due to metastatic inflammation caused by pyogenic organisms, which have been incapable of setting up suppuration, and have gradually died out. Probably the natural resistance of the tissues in these young patients is greater than in the adult, a fact of which we have evidence in the behaviour of hypopyon ulcer in children.

It has already been said that tubercle of the optic nerve head is rare. The same is true of gummatous deposits in this situation, though I can show you specimens of each. The possibility of their occurrence must, therefore, be borne in mind, for metastatic inflammatory deposits, other than those due to the tubercle bacillus or the spirochæta pallida, also occur on the disc. An excellent example of a staphylococcic abscess on the disc has been recorded by Holmes Spicer. Early this year I showed at the Ophthalmological Society[17] a case of swelling of the disc, with much white exudate and some œdema of the surrounding retina in an apparently perfectly healthy woman. There were signs here of partial obstruction of the central vein of the retina, and I am inclined to think that the condition was due to a metastatic inflammatory deposit. It is possible that some other atypical and obscure cases of thrombosis of the central vein have a similar inflammatory origin. I may cite another case, that of a girl, which I showed at the Ophthalmological Society last year.

All the conditions which I have briefly reviewed in the earlier part of my discourse are fairly straightforward and open to no doubt. They have taught us facts which it is impossible to refrain from utilising when we turn our thoughts to other obscure diseases of the eye. We do so the more readily because some of these diseases are unfortunately very common, whilst others,

happily less common, are peculiarly disastrous in their results. As a type of the former group, I will take ordinary subacute or chronic iridocyclitis; of the latter, sympathetic ophthalmia.

Iridocyclitis is familiar to you as an extremely insidious disease leading to deterioration or even loss of sight in people who may otherwise appear to be quite healthy. I need not enter here into a description of its clinical features. Now, we know that iridocyclitis is often a result of gross metastatic inflammation, and we are thereby led to inquire whether the apparently idiopathic cases may not be due to a similar cause. In one well-defined group we are rewarded with success. There is no doubt that these are a sequel of pyorrhœa alveolaris. When the septic condition of the mouth is cured the cyclitis rapidly improves, and does not return. The causal connection of oral sepsis is unmistakable in these cases. Frequently, however, the mouth is in good condition. We then seek a septic focus in some other part of the body. It may be found in the nasal sinuses, in the generative organs (usually in women, who are frequently affected), or elsewhere. In many cases we fail entirely in our search. In these it is probable that the intestinal tract is at fault. Certainly many cases do well on calomel and other intestinal disinfectants. I have recently been adopting Metchnikoff's method of disinfection, displacing the bacterium coli by lactic acid bacilli, but I have not yet sufficient cases to authorise any statement as to results. In any case, the theory which best suits these cases is one of metastatic inflammation, either by bacterial invasion or by the circulation of free toxins. The part acted upon is the epithelium covering the processes of the ciliary body. In considering whether in this and other such diseases we are dealing with bacteria or their products, we must bear in mind that organisms like the diphtheria bacillus, which set free their toxins, are much less common than those whose toxic action is indissolubly bound up with their own vital activity. There remains of course the possibility of specific cytotoxins of non-bacterial origin, but these we may leave out of the question for the present. The subject is one which has appeared to me a likely field for

experimental research, and I have recently been engaged in putting this view to the test. We possess an extremely delicate test of the very slightest disturbance of the secretory functions of the ciliary processes. If an animal is immunised against the red corpuscles of another animal of different species, the serum of the immunised animal contains specific hæmolysins, *i.e.* products in the serum which dissolve out the hæmoglobin from red corpuscles of the immunising animal. In such an experiment, if instead of blood serum the aqueous humour of the immunised animal is taken it is found that no hæmolysis occurs. Now it is well known that if the aqueous is drawn off and the anterior chamber is allowed to fill up again with freshly-secreted aqueous, the second aqueous is highly albuminous. The process of secretion of aqueous by the ciliary processes, though perhaps not simply an act of filtration from the blood, yet follows closely the laws of filtration. When the aqueous is drawn off the intraocular pressure sinks from about 25 mm. of mercury to the atmospheric pressure or zero. The difference of pressure on the two sides of the walls of the ciliary capillaries, intracapillary and extracapillary, is greatly increased. Hence the large molecules of the proteids of the blood plasma, which are dammed back under normal circumstances, now pass through the walls as constituents of lymph, or, as it is called in the case of the eye, the aqueous. Without going deeply into the theory of hæmolysis, it must be pointed out that the process depends upon certain products which are intimately associated with the proteid constituents of the blood plasma. It is not surprising, therefore, to find that the second aqueous, secreted under such circumstances as those described, contains the products necessary for hæmolysis if the animal has been previously immunised ; in fact, it acts very much like the blood serum, though less strongly. Further, it has long been known that the aqueous in cases of iritis or iridocyclitis is highly albuminous. Under these circumstances also, in an immunised animal the aqueous contains the products essential for hæmolysis. The hæmolytic test is one of extraordinary delicacy, and it enables us to distinguish the very earliest signs of disturbance of the circulation in the ciliary body, such as is found in slight congestion or

inflammation. I am at present applying the test to immune animals which have been inoculated intravenously with cultures or toxins of various pathogenic organisms. I think it not improbable that I may be able to discover a specific selectivity for the ciliary body amongst the various organisms.

Lastly, I will ask you to consider for a few moments the possibility of sympathetic ophthalmia being a form of metastatic inflammation. The disease is one which appeals strongly to all ophthalmologists, but it should appeal specially to Bristolians, for it is to a Bristol surgeon that we owe the most beneficent discovery in the history of this malign disease. I need scarcely tell you that I refer to Augustin Prichard, who in 1851 first taught that early excision of the exciting eye prevented the onset of the disease. Like all great discoveries, this treatment was received with distrust, even by that master of ophthalmology, von Græfe, but since it was the truth it had to prevail.

There are many theories of sympathetic ophthalmia, but one fact stands out clearly—it has all the characteristics of a disease due to the influence of bacteria. Attempts to discover the specific organism have hitherto failed, but the theory of a bacterial origin is not thereby invalidated. If it is accepted, how does the organism reach the sympathising eye ? It was natural that direct transmission by way of the optic nerves and chiasma should attract earliest attention, but I think that this so-called migratory theory must be abandoned. The bacterial metastatic theory, to my mind, best explains the facts of the case. It is probable that the organism undergoes development in the exciting eye, thus accounting for a latent period of from one to six weeks. It then enters the blood stream. It is only pathogenic to the eye, because only there does it find a suitable nidus, and even there only if the conditions—resistance of tissues, &c.—are favourable. Prolonged latent period is accounted for by encapsulation in the exciting eye, or in some rare cases in other organs of the body. It would require more time than I have at my disposal to enter fully into a discussion of the pros and cons of this theory of sympathetic ophthalmia, and it is the less necessary as I have dealt with the subject elsewhere.

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THE CAUSES OF TRANSIENT CEREBRAL PARALYSES.

BY

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THE prevention of what are commonly called "apoplectic strokes" is one of the most important and most interesting fields for research at the present time. They cut short so many vigorous lives, or reduce them almost to the level of a vegetative existence. They arise, too, in the course of so many different diseases, and checkmate us when a prospect of recovery is in sight.

The majority of the cases are accompanied by organic lesions, and offer little hope of repair beyond the substitution and training of other nerves and muscles. Certain hemorrhages, indeed, may be absorbed, and if important structures have not been damaged ultimate recovery may take place. In embolism, again, the

collateral vessels are sometimes able to restore the circulation, and the paralysis may then vanish entirely. Indeed, even in permanent cases the extent of the primary damage decreases when the immediate œdema passes away. In strictness too many poisons—such as narcotics and asphyxiants—produce temporary general paralysis and unconsciousness.

Apart from all these, there is a group of rare instances where no organic lesion is found, which are not due to poison, and where complete and often sudden restoration of function may take place. In some the recovery is permanent; in others recurrent attacks are seen which may eventually lead to organic changes and permanent paralysis.

I have recently met with some four or five of these transient paralyses, and a study of the literature shows a considerable number of similar ones. I propose, then, to consider how such attacks are brought about, without entering upon the large and debatable subject of the transient paralyses in certain diseases, such as hysteria and epilepsy, as to which we have very little knowledge. Uræmic paralyses seem worth discussion, however, as some light has been thrown on their pathology. One of my cases occurred in uræmia, two probably were due to arterio-sclerosis, one arose in a healthy man under great mental excitement with possible sclerosis, and another in gouty glycosuria. They all, even the uræmic and gouty ones, seem to be due to some form or other of local and temporary cerebral anæmia.

The following are brief notes of my patients:—

Case 1.—A.N., 44, male. Suffering from chronic nephritis, with six to eight grammes of albumen per litre, numerous casts, and thirty to forty ounces of urine daily. Began to show signs of uræmia by nausea and nocturnal dyspnœa. On October 26th, at 2 a.m., he was found to have a difficulty in speaking, and some weakness of the left side of the face and left arm. A slight convulsion followed. The paralysis increased next day. From October 29th to November 1st the whole of the left side was completely paralysed. The breathing was stertorous, the pulse very feeble. The patient was unconscious for some time, and even when conscious could not put out his tongue or open his mouth. Swallowing was very difficult. No optic neuritis was present. There was œdema of the left leg, arm and left side of

trunk and head. On November 4th the paralysis had almost entirely gone, and the patient was rational and able to talk and swallow. The systolic blood pressure before the attack was 150 mm., but rose some months later on.

Case 2.—M., 71, female, had suffered for some years from gout and dyspepsia, and had recently recovered from an acute erythematous affection of one foot, with excoriation, and then a general dermatitis. On September 20th, while writing a letter, her sight suddenly became dim. For a few minutes she continued to write unmeaning phrases. She next found that she had lost her speech, and with some difficulty she made her way to her bed. When I saw her she was aphasic, and the sight and hearing were both affected. The right hand and foot were not paralysed, but the right side of the face was paretic. All the symptoms disappeared after three or four days. There had been no albumen in the water previously, but now a cloud of albumen and .4 per cent. of sugar were noted. She has remained in good condition ever since, except for some neuritis, chiefly in the right leg, and persistent dyspepsia. The sugar has gradually decreased. The blood pressure was about 135, and the pulse 76 to 80.

Case 3.—H.M., 69, male, who had been going through very great mental worry, was specially disturbed one evening over his business, and complained of feeling very strange. He slipped off his seat on to the floor, and gradually became unconscious, Clonic convulsions and twitching, especially on the right side. appeared, while the left was completely paralysed. The breathing was stertorous, and the corneal reflex lost. The attack lasted, perhaps, three hours. Next morning he had recovered perfectly, and showed no trace of the paralysis. The kidneys were normal. The blood pressure was about 140, and there was a slight blowing systolic murmur heard over the base of the heart. No arteriosclerosis was observed, and he has remained in good health ever since.

Case 4.—G.W., 61, male, had been recently undergoing very great trouble and worry, and when bending down one evening to wash was suddenly attacked with partial loss of power in the right arm and leg. He was admitted to the General Hospital the same evening (June 18th), when right hemiplegia, slight aphasia and paralysis of right side of face were noticed. The knee-jerk on the left side was exaggerated, and that on the right was normal. No Babinski reflex could be obtained. Urine, 1027, no albumen or sugar; blood pressure, 140; chest, emphysematous. Heart: apex in nipple line, sixth space; no murmur. June 22nd.—No paralysis anywhere, but patient complained of pains in the head. No anæsthesia; reflexes normal. Marked arcus senilis. Brachial artery thickens. The temperature varied between 97–99° F.

Case 5.—M.H.P., 70, female, had usually good health, but had at least once passed gall-stones. For the last five years of her life she suffered from occasional attacks of aphasia and vertigo, lasting for a few minutes, but without loss of consciousness. In June, 1907, after an indigestible meal, gastritis and acute vomiting prostrated her for three days. She seemed well for a day or two, but awoke one morning to find herself partially aphasic and hemiplegic. She could still grasp feebly with the affected hand, and stand when supported. The pulse was fairly strong and regular; the blood pressure 170. The paralysis gradually increased, and death took place in November. No kidney trouble existed, but arterio-sclerosis seemed general. Here slight transient attacks had recurred for years, to be finally replaced by a permanent one.

To return to the general question of the causes of transient cerebral paralyses. They can be produced by stoppage of the brain circulation in certain areas, or by anything which interferes with the physiological action of the blood; by poisons which directly affect the nervous substance; conceivably by direct pressure on the motor tract; or by exhaustion of certain nerve centres. We may provisionally, then, tabulate the causes as follows:—

(*a*) *Cerebral Anæmia or stasis*:

(1) General, produced by—

(i) Compression of the vessels of the neck.
(ii) Cardiac or respiratory failure.
(iii) General vaso-motor paresis.
(iv) Asphyxia by CO_2 and similar bodies.

(2) Local obstruction or compression of cerebral vessels from—

(i) Arterio-sclerosis or atheroma.
(ii) Syphilitic thickening.
(iii) Tumours and foreign bodies.
(iv) Effused blood and the œdema of softening.
(v) Uræmic œdema and hydrocephalus.
(vi) Inflammatory effusions, as in meningitis.
(vii) Certain small emboli.
(viii) Possibly spasm in Raynaud's disease and migraine.

(*b*) *The action of poisons, exhaustion of nerve centres, and unknown causes as seen in :*

(1) Narcotic poisoning.
(2) Hysteria.
(3) Eclampsia.
(4) General paralysis, myasthenia gravis.
(5) Post-epileptic states, some forms of petit mal.
(6) Chorea paralytica.
(7) Lead encephalopathy.
(8) Recurrent paralysis of the third nerve.

In the first group we have a number of causes which act on the hæmic stream. From the well-known experiments of Kussmaul, Tenner, and many others, we find that sudden occlusion of the arteries of the neck leads to convulsions, and then to paralysis. If the cerebrum alone be deprived of blood, we get paralysis and unconsciousness. If the bulb suffers too, convulsions. Similar results appear in the condition named after Stokes-Adams. Stoppage of the venous outflow has nearly the same effect, and so has a substitution of saline fluid for arterial blood. It is often said that " an increased flow of blood to the head " may cause like results, but in normal conditions " increased arterial flow is at once followed by increased venous outflow," *i.e.* the rate of the current alone is increased. The circulation in the brain under a rise of arterial pressure is converted into a system of rigid tubes, and there is practically no evidence that continued high pressure can cause paralysis or other cerebral symptoms.[1] If both veins and arteries are occluded, as in hanging, the results are the same as in compression of the arteries alone. People who have been hanged and cut down before death, describe their feelings as including, first a tingling in the limbs, then convulsions, and then complete loss of power to move them, before the blank of unconsciousness comes on.[2] Hence so many die in accidental hanging when a slight movement to seize some support would have saved them. Again, as Dr. Leonard Hill points out, the cerebral pressure varies absolutely with the venous pressure of the body, and only relatively with the arterial, and therefore venous obstruction alone may

give rise to the symptoms of cerebral stasis or anæmia. Thus paralysis may occur in respiratory obstruction, or in the sinus thrombosis of chlorosis. I have seen a transient hemiplegia in whooping cough, though here the possibility of a small hemorrhage must not be forgotten.

Localised vascular obstructions are of still greater importance. It is a common experience that a tumour, foreign body, or depressed bone does by compression of veins and capillaries cause stasis in a given area and the symptoms of local anæmia, while a return of function follows the removal of the mass. Similar transient paralyses may follow the displacement of an embolus. Very much discussion has arisen as to whether local cerebral anæmia arises solely from such causes, or whether active spasmodic constriction of the cerebral vessels can take place. Not long ago Dr. Leonard Hill stated that trustworthy methods had as yet failed to demonstrate any action of vaso-motor nerves on these vessels, and it is certainly quite clear that they are not affected by the general vaso-motor centre. Gulland, indeed, showed the existence of nerves on the pial vessels, but no contractile power has been demonstrated in them by ordinary methods. Most observers have failed to produce contraction of the vessels in any degree, after trying all kinds of vaso-constrictors, such as the injection into them of suitable drugs to act on their muscular coats. On this view, the cerebral vessels passively receive and transmit the blood stream, the pressure of which is predetermined by the variations of the systemic, and especially of the splanchnic, vessels.

On the other hand, Bastian, W. E. Russell, and the Scotch school insist that while these brain vessels are not linked up to the general vaso-motor centre, they are still capable of local or general constriction from nerve stimuli, or from substances in the blood stream acting directly on their muscles, such as the products of the suprarenal and pituitary glands. Cushing[3] has been able to demonstrate the action of adrenalin in blanching the pial vessels, and claims that under some circumstances Faradic stimulation will contract the cortical vessels. Carl F. Wiggers,[4] too, has been able to show by special methods some active vaso-motor changes produced by drugs, and in a later paper, based on the pressure

variations in tubes supplying an artificially-perfused brain, he gives further evidence of the action of vaso-motor nerves. Even under the most delicate tests, however, the action is slight, and the muscular coats are peculiarly feeble compared to those of the rest of the body. Corroborative evidence is found in certain cases of Raynaud's disease.[5] Thus Osler[6] reported the concurrence of hemiplegia and aphasia with a typical spastic condition of the vessels in a limb. Lindsay Steven[7] describes a similar concurrence where *post-mortem* an area of white necrosis without visible arterial disease was found in the brain area related to the paralysed limbs. Finally, if the retinal vessels are looked on as part of the cerebral circulation, it may be worth noticing that W. E. Russell and others[8] have seen a temporary contraction of the retinal arteries, both in Raynaud's disease and in quinine poisoning, while Cushing and Bordley point out that trephining not only relieves cerebral compression, but abolishes the existing retinal changes at the same time.[9] Still, on the whole I am inclined to think that, while we have good evidence of a slight degree of active vaso-motor power in the cerebral vessels in ordinary conditions, it is almost entirely overshadowed by the far greater and stronger systemic variations, to a much higher degree, perhaps, than the pulmonary vaso-motor agency is overshadowed by the splanchnic. Thus we are justified in most cases in regarding the cerebral circulation as a passive one, in spite of the researches of Wiggers and others, at the instance of Prof. Kocher. Again, too much weight should not be given to the striking phenomena in Raynaud's disease, for the contractions there, even in the systemic circulation, are of quite unknown pathology, of exceptional severity, and not capable of experimental reproduction. It is not reasonable to invoke the tempting hypothesis of a local spasm of the feeble cerebral vessels to explain every difficulty, since there is abundant evidence that ordinary vaso-constrictors entirely fail to produce it. Even if we add this additional link to the chain, we have still to explain what causes this spasm in the vessels of a certain isolated area. We are no better off, and it is simpler to suppose a toxin in the cells of that area at once.

Arterio-sclerosis.—How, then, can we explain the many cases of transient paralysis found in persons of perfect health except for sclerotic changes, local or general, in their vessels? Their blood pressure is often high, but sometimes the reverse. Now if certain vessels are partially occluded and inexpansile from sclerosis or cerebral syphilis, when any rise of general blood pressure occurs the neighbouring healthy ones will be over-distended, and will in turn compress and render anæmic the capillaries in the area of the diseased vessel, for the pressure in the former will be higher than in the branches of the occluded vessel beyond the obstruction. Hence a paralysis may occur. If now we give nitrites to abolish the rise of general pressure this effect will cease, and the capillaries of the diseased artery may again become permeable. In other cases the blood pressure may be so high that the heart fails to overcome it and to drive the blood past the obstruction. Here again temporary relief by nitrites may so strengthen the heart that it will succeed in passing on the blood. On either supposition we can account for such cases as I have described. We see that the blood stream is suddenly cut off in a limited area, and paralysis follows. Under favourable conditions the vessels again become permeable, and function is restored. We know of no circulating toxin in many of these patients to cause a spasm, but more or less obstruction can be demonstrated *post-mortem*. Cases illustrating this type of attack and reported by Gowers,[10] Griswold,[11] Fox,[12] Rhein,[13] Grossmann,[14] Davidson,[15] E. O. Daly,[16] Stengel,[17] Edgeworth,[18] Langwill, Lundie and Easterbrook,[19] W. E. Russell,[20] Knapp,[21] Jacobson,[22] and many others show every variety, both in the area affected and in the duration of the paralysis. There is little distinction between the frequency of left and right-sided attacks; sometimes in the same patient the attacks change from one side to the other. There may be gradual or sudden onset and recovery. At times the paralysed patient cries out, "Now I am all right," and the limb is restored at once; or there may be a slow recovery lasting some hours or days. There is nothing distinctive, again, as to convulsions or loss of consciousness. D. J. Macarthy[23] holds that there are two forms of these transient paralyses in

arterio-sclerosis. (1) The first is that of cortical exhaustion, directly due to the obstruction cutting off the blood supply temporarily. Here we get the same symptoms as in hemorrhage, namely unconsciousness and paralysis, but temporary only. Similar attacks occur from time to time, till finally softening and permanent effects result. This, by the way, explains a number of cases given by W. E. Russell, where in persons of high tension and sclerotic vessels recurrent attacks were succeeded by a fatal hemiplegia ascribed to hemorrhage. A *post-mortem*, however, showed softening only. (2) The other type is, as he thinks, due to microscopic areas of softening. Here temporary paralyses occur without loss of consciousness. Personally I cannot accept his distinction. He makes, however, a useful suggestion as to the differentiation of these attacks from permanent paralysis at an early stage, in that, on careful watching, slight movements of the affected limb may often be detected in a transient case. We must, however, be careful not to mistake movements in the ingravescent stage of a hemorrhage for such remissions.

An important question arises whether transient paralysis can occur in simple hyperpiesis. We know that high blood pressure exists with perfectly healthy vessels for a time at least in some persons. Can a localised anæmia, as distinct from general syncope, take place here ? I have not yet found an undoubted case on record, and our present knowledge of the brain circulation rather points to its impossibility. We have acknowledged that in Raynaud's disease there is evidence of spasmodic contraction of cerebral vessels as of other vessels, but whether there is a local disease here we do not know. In *migraine*, too, Marcus Gunn notes that hemiparesis and aphasia of a temporary type are sometimes seen. W. E. Russell mentions the case of a young man who when overworked had similar attacks ; and like instances are known to many of us, but in the absence of any knowledge of its pathology explanation is impossible. Osler, indeed, remarks that arterio-sclerosis has been seen on the affected side in some cases.

Uræmia.—If we put on one side the paralyses due to cerebral hemorrhage, which are not uncommon in the uræmic state, there

are still a remarkable number, often of transient duration, for which no organic cause can be found *post-mortem*. Thus Baillet in thirty-seven instances could find no visible lesions in twenty-nine. Their frequency is a matter of everyday experience. Rhein,[13] indeed, thinks they are due to microscopic areas of softening, which he demonstrated in a few cases; but it is quite possible that these areas are a result, not a cause of the attacks. In several of his instances a syphilitic origin was possible, and at present they do not appear to have been found in a large number of uræmic patients. Others, again, have referred these paralyses to arterio-sclerosis or high blood pressure, both common but by no means universal complications of uræmia. Still, it is quite clear that many cases exist where these causes are absent. R. W. Phillip[24] reports a case of hemiplegia in lardaceous disease where neither hemorrhage nor softening was found *post-mortem*, and no heart trouble or atheroma existed, but only œdema. The theory of uræmic toxins has been widely accepted. Castaignac, believing that the cerebro-spinal fluid in uræmia contains a poison which acts on the nerve tissues directly, injected it into animals, and produced convulsions. Weissenburg,[25] like Rhein, claims to have found changes in the nerve cells and degenerations of the motor tract, but it is difficult to imagine these changes causing transient paralyses. Finally, there has been of late a revival of Traube's old view that they are due to œdema. This may be local or general. Various forms have been given to this theory. Macarthy[26] seems to say that the œdema by compression and obliteration of arteries leads to malnutrition of the cortical cells. We really have to choose between a local cerebral anæmia produced by œdema,[27] (or in some cases by sclerosis) as one explanation; and in opposition to this the theory of the action of uræmic toxins. Now, as Byrom Bramwell[28] points out, toxins are present in large quantities in latent uræmia, and yet produce no symptoms. They are not to any great extent removed by venesection, and yet a slight bleeding will sometimes immediately remove uræmic symptoms. Again, the toxins are clearly carried by the blood stream to all parts of the brain, and one cannot imagine that this affects one side of the brain and not the other,

causing the common hemiplegias and monoplegias. Trephining, too, will at times give rapid relief, as in a well-known case of Byrom Bramwell's, and in a more recent one of Cushing and Bordley's.[29] Lumbar puncture has been equally successful in many instances reported by McVail,[30] Willson,[31] and others. Thus in every one of Willson's six cases of uræmic convulsions the movements ceased after the puncture was made. Here the abstraction of a very small amount of fluid sufficed to relieve the pressure; but the method is not uniformly successful, firstly, because of the ease with which the channel from the cranium is obstructed, and, secondly, because if the œdema is localised and not due to free fluid there can be no drainage. As one of these writers noticed, if fluid flows freely from the trocar the results are much better than when very little comes away. There seems, then, fairly strong evidence that œdema is the cause of many uræmic paralyses, and the results of trephining in the cases referred to are almost conclusive. The other causes suggested appear inadequate, while cerebral anæmia, which is so common a source of transient paralyses, would easily be produced by it. Cerebral œdema in some diseases is said to be merely compensatory to atrophy of nervous tissues, and does not compress vessels; but there can be no atrophy in acute nephritis, for instance, yet the trephined cases showed a great excess of serum. Cushing and Bordley refer to the close similarity between the retinal changes in many of these cases and those seen in patients where a tumour has interfered with the brain circulation. These retinal changes are also quickly relieved by trephining in either condition. In short, whether œdema is produced by a tumour, a blood-clot, a foreign body, or by the uræmic state, it equally compresses capillary areas. In many other diseases, transient paralyses are also produced by œdema, notably in *meningitis*. Kuh[32] gives a curious instance of recurrent attacks of left hemiplegia in a young man during ten days, each attack lasting about twenty minutes. This was followed by permanent right hemiplegia and death. It must be allowed that there was a history of syphilis, but the arteries were found to be normal. There was no softening or hemorrhage, and merely a great increase of serous fluid in the brain. In *lead*

encephalopathy we meet with transient paralyses, as well as other cerebral symptoms. Their distribution is hemiplegic or general, and quite unlike that of ordinary lead poisoning, which picks out certain spinal segments. Oliver[33] points out that the "brain substance may here be pale and very firm, or pale and œdematous as in cases of uræmia." The neuro-retinitis, too, while singularly like that of uræmia, may occur without any affection of the kidneys, and seems not improbably due to the pressure of œdema. Local and temporary œdema, then, is likely to be the cause of these paralyses, but the direct action of lead on the brain substance is also possible. In *eclampsia*[34] and *general paralysis* similar attacks are common. Mott,[3] referring to certain experiments of his own in producing brain œdema, says: "This makes it probable that the epileptiform seizures in general paralysis are dependent on venous stasis, which leads to arterial anæmia and excitability." In diabetes, again, Williamson[36] points out that cases of hemiplegia and other brain affections have been found with no visible lesions to account for them, and he compares them to the paralyses in uræmia. He quotes from Lepine and Blanc an instance of hemiplegia and convulsions in diabetes, with microscopic areas of softening. Œdema of the face or body sometimes occurs, and was noted by Frerichs[37] in 6 per cent. of his cases without kidney disease. Whether my patient's attack was due to cerebral œdema, probable as it is, I have no evidence to show.

In conclusion, a great number of transient paralyses in various diseases appear to be caused by acute localised brain anæmia. This is produced either by vascular degenerations or by compression from active œdema, and accounts for their transitory character.

My grateful thanks are due to Dr. Leonard Hill for kind references and information.

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THE PHYSIQUE OF BOYS.

BY

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THE full title of this paper should be, "A comparative study of the heights, weights, and chest measurements of boys of 13, 14 and 15 years of age in Industrial and Public Schools."

For some years quarterly weighings and measurements have been made of all the boys under my care at the Clifton Wood Industrial School. This was done for three objects: (1) to have an accurate record, (2) to find if the dieting was sufficient, and (3) to show whether any boy was, unobserved, developing any tubercular disease.

As the members of this Society probably know very little about what are known as the Home Office Schools, I will, with your permission, give a few facts about these excellent institutions. The common idea is that they are supported by charity. This is not so. A few donations are made, but the bulk of the money for education, feeding and house expenses comes from two sources, the rates and the Government. I need not go into the details of this, but I may say that the schools are under a dual control, inspectors being sent by the Home Office, while a member of the Committee is specially told off to watch the boys of any particular town that sends boys to the school. In our school the majority of boys come from London, Derby and Bristol, not 5 per cent. coming from other places.

The boys are drawn from the lowest class of our civilisation; but we contend that if you catch them early, we can, like Dr. Johnson's Scotchman, do something with them. I was only the other day looking through the entry book and noting the parentage. I should think, though I cannot speak from figures, that a large percentage are the sons of prostitutes or dissolute mothers. In many cases it is recorded that the father was a drunkard, sometimes both parents. In fact, we must admit that the material we have to work on is the worst that can be obtained.

The boys themselves come to us with a bad record. They have committed some petty theft, picked a pocket, have been incorrigible truants, or possibly simply because they are living in a house where vice and drunkenness are rampant. Brought up under such conditions, it is not surprising that, mentally and physically, they are below the standard required to make good citizens. Fortunately we can remedy one of their failures. We can, and do, turn them out well educated for their station in life, and obtain for them places where they can, and do, become useful

members of our country; but we cannot, as I shall show, bring them up to the standard of those boys who have been born in a more well-to-do position.

The quarterly weighings are begun directly the boy enters the school, and the book is open for my inspection at any time. A look through has often proved of great use to me. A boy is noticed not to be gaining weight in proper proportion, or is even losing. I have him sent for. If no cause can be found, I order special diet or medicine, or suggest a month or two in the cooking department, and I have often been gratified with the result. In one case I had a boy weighed weekly for over a year. He had been under me for tubercular peritonitis in the Children's Hospital, and the weekly report was of the greatest value. He is still in the school, and doing well.

I mentioned that one of the reasons for recording weights, &c., was to see if the dieting was sufficient. I would ask you to remember that with these boys a scale of dieting has to be made, and a boy of x years is supposed to eat y amount of food. The rule is not absolute, but it works well. Feeding a large number can be done extremely cheap; but it will surprise you to hear that our boys are well fed on under 5d. a day, four meals being given, with meat once a day except one day of the week. The boys have to do all the manual work of the building—the washing, cleaning, and making beds—besides drill, gymnasium, carpentering, and making all their own clothes. Besides this, they play football or cricket twice a week, learn to swim, and have to walk to the Downs for their games. You will therefore see that a great deal is taken out of them. The question was were we putting enough in, and from our physique record we came to the conclusion that we were not. So we gave another meal—a glass of milk and some biscuits—with very satisfactory results. It meant an outlay of £20 or more a year, for which we received nothing from the authorities.

To come to my tables. I have always said that statistics, especially in medical matters, were futile things; so to show my inconsistency, I am going to give you some.

These averages were worked out on a fairly large number of

boys; and for the sake of comparison I have put down the standard published by Roberts, and compared the figures with those obtained from Marlborough College, the only Public School where accurate measurements have been systematically made.

The first point that must strike us in looking at these tables is that there is no recognised standard, or perhaps that the standards are inconsistent. Compare, for instance, Roberts's with that of the Anthropometric. For a boy of 13 the former gives the height as 55 inches, the latter as 57, while neither the two Industrial Schools nor Marlborough College come up to the latter, the Industrial Schools being 2 inches below. Then in weights Roberts, at the same age, gives 78 lb., the Anthropometric 82. The Industrial Schools are much below, while Marlborough College is a long way above. Even in Boulton's table, in which ages are not given, a boy of 55 inches should weigh only 77 lb., a pound less than Roberts makes out.

I need hardly comment on these tables, as a glance through them will explain the discrepancies at once. But we see the enormous advantage the boys of the better-to-do classes have. This has been explained by the better food. The food a Public School boy takes depends on two factors—the diet supplied by his house-master, and the pocket-money supplied by the parent. One point I may call attention to. The Industrial School boy starts 2 inches below the average (Roberts's) at 13, and at 15 is 3 or $2\frac{1}{2}$ below, while his weight increases in greater proportion, showing that in spite of all we can do he not only does not pick up the lost ground in his height, he even loses.

In the second table I have analysed the schools for different towns. Here it is flattering to our city to observe that the Bristol boys have the best physique; but on the other hand, I am told by the masters that the London boys are more intelligent and quicker in their work.

My London figures for the Clifton School and Nautical School correspond very closely. Those for Sheffield were taken from an article in *The Practitioner*, and were made from deficient children. The author of this article says, half in apology for the high figures, that it does not follow that a mentally deficient child is physically

stunted. The table shows that they are below the average of London, Bristol or Derby.

The following tables give the height, weight, and chest measurements at the ages of 13, 14, and 15. In the first the different schools are compared with the standard authorities, and in the second the comparisons are with the boys coming from various cities.

TABLE I.

	Age 13.			Age 14.			Age 15.		
	H.	W.	CH.	H.	W.	CH.	H.	W.	CH.
Roberts	55	78	25	58	84	26	60.5	94	27
Anthropomet. Stand.	57	82	—	59	91	—	61	102	—
Boulton (no age) ..	55	77	—	59	91	—	60	90	—
Clifton Wood ..	53	71.5	26.7	54.9	83.5	27	57.5	83.9	28.6
Nautical School ..	53	71.9	25.8	55	81.5	27.2	57	98.2	28.9
Marlboro' College ..	56	95	31.1	61	105	32.2	63	120	33.4

TABLE II.

	Age 13.			Age 14.			Age 15.		
	H.	W.	CH.	H.	W.	CH.	H.	W.	CH.
London	51.7	67	26.1	53.4	76.4	27	55.5	83	28
Derby	53	71.5	26.6	55	89.9	27.4	57.2	92	28.8
Bristol	54.5	75	27.5	56.3	84.3	28.4	60	90.6	28.8
Sheffield	51	60	—	55	76	—	57.5	77	—
London, N.S. ..	52.6	71	25.8	55	77.8	27.3	54	83.5	28.5

THOMAS DOVER: PHYSICIAN AND MERCHANT ADVENTURER.

BY

J. A. Nixon, M.B. Cantab., M.R.C.P.,

Physician to the Bristol Royal Infirmary.

In a recent review of a volume of essays by Professor Osler[1] Thomas Dover was referred to as "Dover the Buccaneer, who for four years harassed the coast of South America; . . . thoroughness pervaded both his medicine and his piracy." Thus do our simplest actions suffer misconstruction at the hands of posterity. Here is a conception of Dover sailing the Spanish Main steeped in the blood of hecatombs of innocent mariners, genially encouraging

the timorous hearts to step out boldly along the plank to sup with Davy Jones, and paying his morning and evening devotions to the "Jolly Roger" at his masthead. The truth, however, reveals a much more prosaic personality. The expedition on which Thomas Dover sailed was in no sense of a piratical nature; it was one of those adventurous trading cruises of which Hakluyt in his *Principal Voyages of the English Nation* gives many instances. It was an accident of the times that few of these trading expeditions ran to their finish without the spilling of blood, for in 1708 the power of Spain was not yet broken in America and the Indies, while France, emboldened by the decline of the Dutch navy, was making free use of the high seas. Small wonder if an English merchant vessel set out ready to fight if need be, and show by her sharp teeth that she, too, claimed the right to pass on the seas upon her lawful occasions. Commerce did not follow the flag in those days, but bore it close company in its journeyings over distant lands and oceans.

The voyage round the world of the two privateers, the *Duke* and *Duchess*, under command of Captain Woodes-Rogers,[2] was the properly-accredited enterprise of the Merchant Adventurers of Bristol. The owners included three merchants who sooner or later were Mayors of Bristol, Sir John Hawkins (1701), James Hollidge (1709), and Christopher Shuter (1711), together with Captain Philip Freake and Thomas Clements, who were sheriffs, and John Romsey, town clerk.[3] These and several others contributed the necessary expenses of the expedition, and it was in virtue of his own share that Dr. Dover was selected to represent the owners' interests, and sailed on the *Duke* as second captain under Woodes-Rogers, and captain of the marines. The navigation of the sister ships was entrusted to Woodes-Rogers: but Dover was appointed to preside over all the councils, with the privilege of exercising two votes; and his share of all plunder was calculated in thousands as against the hundreds of the other senior officers, indicating that he was interested financially in a higher ratio than any others on board. The council for directing the affairs of the ships *Duke* and *Duchess* (*sic*) in their voyage to America was composed of Captain Woodes-Rogers, commander, Captain

Thomas Dover, and Captain Dampier, pilot, with other officers. "In case of equality Captain Dover is to have double voice as President of the Council."

The medical welfare of the ships should have been amply provided for. In addition to Dover, there sailed "John Ballet, rated third mate, but designed surgeon if occasion (he had been Captain Dampier's doctor in his last unfortunate voyage round the world); Samuel Hopkins, being Dr. Dover's kinsman* and apothecary, was both assistant to him and to act as his lieutenant if we landed a party anywhere under his command during the voyage;" John Vigor, a reformado, to act as Captain Dover's ensign when ashore; James Wasse, surgeon, Charles May, his mate, and John Lancy, assistant. Another Hopkins (William) was designated ship's corporal, Captain Dover's serjeant, and cook to the officers. Yet in spite of this array of surgeons and assistants, Woodes-Rogers has reason to record: "Our surgeons make heavy complaints for want of sufficient medicines with which till now I thought we abounded, having a regular physician, an apothecary and surgeons enough, with all sorts of medicines, on board . . . but now we found it otherwise."

It appears that Dr. Dover's interest in the undertaking was commercial rather than medical. On another occasion a doubt arises as to the technical skill of the surgeons, for on October 30th, 1709, it is recorded: "One of our negro women cryed out, and was delivered of a girl of tawny colour. Mr. Wasse, our chief surgeon, was forced to discharge the office of midwife," in which duties, it seems, he was somewhat unpractised.

Dover made himself, as was his wont, an extremely cantankerous travelling companion, and eventually, on October 11th, 1709, was persuaded to betake himself to the other ship, the *Duchess*.

In the January following he asserted his seniority in a fashion little to the liking of the ships' officers. A prize had been taken, and Dover claimed as second captain to be appointed to command her, but the navigating officers protested: "We therefore (being inclined to peace and quietness aboard, and not to use any violence

* He had married Dover's sister.

to remove the said Captain Dover out of the aforesaid forc'd command, although he is utterly incapable of the office) do hereby publickly protest against the aforesaid commander." Even as a buccaneer he seems to have had his limitations. Woodes-Rogers, in answer to this protest, writes: "I being very weak and in much pain [he had been shot through the cheek] was not able to stir, therefore sent my opinion in writing as follows, 'My opinion is, that 'tis not for the safety of the rich Spanish prize that Captain Dover command her, because his temper is so violent, that capable men cannot well act under him, and himself is uncapable!'" Ultimately he sailed as commander of the prize, but the honour was purely titular, for he was forbidden to interfere in any way with the navigation of the ship, a competent captain being appointed who was to take no orders from him. Presumably, he accepted the position with such grace as he could exhibit, for the expedition came safe to port.

That his share of the booty was substantial may be judged from the fact that in 1712 John Romsey presented to the Bristol Cathedral a pair of large silver candlesticks of the plunder in this expedition which cost him £114.[4] These candlesticks,* by the way, were afterwards removed, but were restored in 1891, soon after the death of Dean Elliott. Romsey was town clerk in 1685, at the assize when Judge Jeffreys made his well-known comments on the kidnapping propensities of the civic magnates of Bristol.

It was, in all likelihood, Dover's violent temper that earned him the cordial dislike of the medical profession of his day, quite as much as his advocacy of quicksilver.

As a physician he had no little experience, and was well-qualified to practise medicine. Like his master, Sydenham, he migrated from Oxford to Cambridge in order, doubtless, that he might sit at the feet of Dr. Brady, then Master of Gonville and Caius College. The register of admissions shows that at Michaelmas, 1686, the first to enter at that college was "Thomas Dover, from St. Mary Hall, Oxford, where he resided six years, admitted pensioner to the scholars' table. Surety, Mr. Lightwine.

* They are of English manufacture, and bear the hall-mark of Queen Anne's reign.

Matriculated at Magdalen Hall, Dec. 1, 1680. Age 16. Son of John Dover, of Barton-on-the-Heath, Warwicks, gent. B.A. Oxford, 1684. M.B. (Cambridge), 1687."[5]

At a later date he settled to practise in Bristol. "The first medical man who gratuitously offered his services on behalf of the poor under the care of the guardians of this city was Dr. Thomas Dover in 1696. This gentleman, in 1708, became part owner and second captain of the *Duke*, privateer, under the command of Captain Woodes-Rogers, and went with him upon a cruise into the South Seas. The Doctor, now Captain Dover, went ashore on the Island of Juan Fernandez, where he met with Alexander Selkirk, a Scotchman, who had lived there four years and four months, having been left on that uninhabited island by Captain Stradling of the *Cinque Ports*. Selkirk, upon his return to England, gave his papers to Daniel Defoe, who manufactured therefrom the interesting and well-known history of *Robinson Crusoe*. Dr. Dover, towards the decline of his life, resumed his profession, and made much noise in the medical world by recommending the use of crude mercury," but says Johnson,[6] writing in 1828, "I am not informed if Bristol then became his residence." Dover himself describes his work on behalf of the poor under the guardians: "About fifty years since, this Fever raged much in Bristol [*i.e.* spotted fever], so that I visited from twenty to thirty patients a day for a considerable time, besides their poor children taken into their workhouse, where I engaged myself, for the encouragement of so good and charitable an undertaking, to find them Physick and give them advice at my own expence and trouble, for the two first years."[7]

Evidently Dover was a wealthy man who practised medicine because he liked it, and without much thought of profit. His buccaneering amounts to accompanying in person one of the numerous trading expeditions which set out from Bristol and other ports to obtain by purchase or persuasion the produce of the New World, and, if Fortune smiled, the rich cargoes of sundry foreign galleons.

The entry in the Caius College register of admissions has thrown considerable light on the hitherto unknown ancestry of

Thomas Dover. The present Rector of Barton-on-the-Heath, Rev. A. Nettleship, has very kindly searched the baptismal registers of his parish, and has found the following entry in the year 1662 :—

> " Thoma Douer filius Johañis Douer gen./et Elizabethæ uxoris ejus baptizatus sexto/die Maij An pdict."

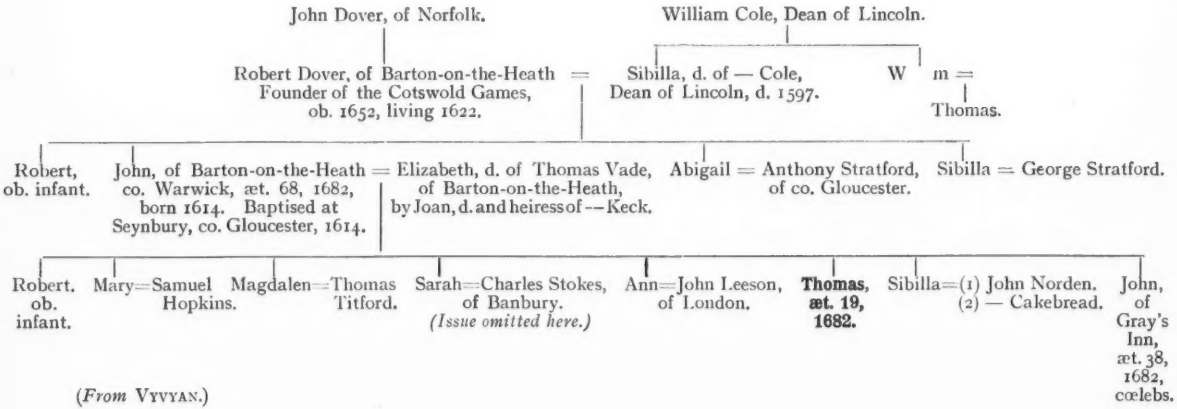
Vyvyan,[8] in the introduction to his reprint of Captain Robert Dover's *Annalia Dubrensia*, gives a genealogical table of this branch of the Dover family, which he states is in the handwriting of the late Sir Thomas Phillipps, Bart., in the copy of the *Annalia* belonging to that well-known collector's library.

From this it would appear that Thomas was the grandson of Robert Dover, who founded the famous Cotswold Games, as related by Rudder[9] in his *History of Gloucestershire* :—

" Mr. Robert Dover, who lived in the reign of King James the First, became a very popular man in this country by his hospitality and generosity. He instituted an annual meeting for the practice of all sorts of manly exercises, and distributed prizes to such as excelled in them. These exercises and their patron are the subject of a small collection of verses intituled *Annalia Dubrensia*, written by the best poets of that age. And there is still (1779) a meeting of young people upon Dover's Hill, about a mile from Campden, every Thursday in Whitsun Week."

Robert Dover (1575–1641), an attorney " who never try'd but two causes, always made up the difference," was the son of John Dover, of Norfolk. He married Sibilla, daughter of Dr. Cole, Dean of Lincoln, and had two daughters and one son, Captain John Dover (b. 1614, æt. 68 in 1682), who fought under Prince Rupert. According to the Phillipps' genealogy, this John Dover married Elizabeth, daughter of Thomas Vade, of Barton-on-the-Heath, and had issue four daughters and three sons: Robert, who died in infancy; John, of Gray's Inn, æt. 38 in 1682, cœlebs; and Thomas, æt. 19 in 1682.

John, of Gray's Inn, figures in the Barton Registers in the year 1644 : " John the sonne of John Dover gent/baptized the 28th of October." In *Dict. Nat. Biog.* he is described as a dramatist, the son and heir of John Dover, of Barton-on-the-Heath, and


John Dover, of Norfolk.
William Cole, Dean of Lincoln.
Robert Dover, of Barton-on-the-Heath = Sibilla, d. of — Cole, W m =
Founder of the Cotswold Games, Dean of Lincoln, d. 1597.
ob. 1652, living 1622.
Thomas.
Robert, ob. infant.
John, of Barton-on-the-Heath = Elizabeth, d. of Thomas Vade, Abigail = Anthony Stratford, Sibilla = George Stratford.
co. Warwick, æt. 68, 1682, of Barton-on-the-Heath, of co. Gloucester.
born 1614. Baptised at by Joan, d. and heiress of — Keck.
Seynbury, co. Gloucester, 1614.
Robert. ob. infant.
Mary=Samuel Hopkins.
Magdalen=Thomas Titford.
Sarah=Charles Stokes, of Banbury.
(Issue omitted here.)
Ann=John Leeson, of London.
Thomas, æt. 19, 1682.
Sibilla=(1) John Norden. (2) — Cakebread.
John, of Gray's Inn, æt. 38, 1682, cœlebs.

(*From* VYVYAN.)

grandson of Robert Dover. In 1661 he was admitted demy at Magdalen College, Oxford, but left in 1665 without taking a degree. He intended to follow the law, and entered at Gray's Inn May 19th, 1664. Ultimately he took orders in the church, and became in 1688 Rector of Drayton, where he died in 1725 in his eighty-second year.

The evidence here agrees with the supposition that the Thomas Dover who matriculated at Magdalen Hall, Oxford, in 1680, at the age of sixteen, and entered Caius College in 1686, is the person referred to in the baptismal register of Barton, and in the Phillipps' genealogical table. A grave difficulty, however, arises out of a statement in the *Dict. Nat. Biog.* that the Rev. John Dover was born after his mother had passed her sixty-first year, so that she must have been seventy-eight when Thomas was born. This statement is given on the authority of Mrs. Cordwell, the daughter of the Rev. John Dover, and is on the face of it unlikely, since Captain John Dover was born in 1614, and was therefore only thirty when his son John was born in 1644. It is more reasonable to accept Sir Thomas Phillipps' account, for this is supported in other directions.

Thomas Dover clearly belonged to this family, and passed no small part of his life in the fair Cotswold country. He dedicated the *Physician's Legacy* to Robert Tracy, Esq., of Stanway, in Gloucestershire (where Robert Dover had built a house in which he died, and was buried in the parish church June 6th, 1641). In 1700 he issued a reprint of *Annalia Dubrensia*, in which, after the letter from Walbancke to Robert Dover, the following words occur: "Dr. Dover thought it his Duty to perpetuate the Memory of that Good Man his Grandfather." *

Vyvyan confuses this Dr. Dover with John Dover, the Rector of Drayton; but the latter never proceeded to a doctor's degree.

* I give this on the authority of Vyvyan and *Dict. Nat. Biog.* The British Museum has two editions of the *Annalia Dubrensia* printed in 1636 (Robert Dover and Walbancke), one later edition (without title-page, &c.) undated, and reprints in 1877 and 1878. Watt, Birt and Loundes in their respective books know of nothing republished in 1700.

Hyett, *Trans. B. and G. Arch. Soc.*, xiii, 179, deals fully but inconclusively with the authorship of this edition.

On the other hand, Rudder gives to Thomas Dover the credit of being the founder of the Cotswold Games when he describes Stanway Hall: "The present manor-house is large and handsome, situated on the slope of the hill, with good gardens, and a cascade of water, seen from the vale below at the distance of several miles. It was built by Sir Paul Tracy in the reign of King James the First, and was the seat and residence of Robert Tracy, Esq., till the time of his death in the year 1767. The famous Doctor Dover who instituted the Cotswold Games died at this house in the year 1742, and was buried at his own request in the vault belonging to the Tracy family. No gentleman now (1779) resides at Stanway House."

The same account occurs in Rudge's[1] *History of the County of Gloucester*, and is probably a quotation from Rudder: "Doctor Dover, well known for the institution of the Cotswold Games, died here (*i.e.* Stanway) in 1742, and at his own request was buried in the family vault of the Tracys." Both these historians depended very largely for their information on Sir Robert Atkyn's *Ancient and Present State of Gloucestershire* (1712); but as no statement akin to this occurs, it is not a misquotation from Atkyns. Rudder is responsible for originating the story, and it should be noted that he gives the date of Thomas Dover's death as 1742, thus agreeing with other authorities. The statement in the *Dict. Nat. Biog.* and elsewhere, that Dr. Dover died in London at his house in Arundel Street, is based upon a conjecture of Munk's.[11] The accuracy of the Gloucestershire historians cannot well be impugned on the strength of such a conjecture, and there can be little doubt that in his own Cotswold home Thomas Dover, M.B., was better known and better loved than in London, where, as "the quicksilver doctor," the hot-tempered circumnavigator met with scant courtesy from "the gentlemen of the Faculty who," he says, "like moles, work underground, lest their practices should be discovered to the Populace."

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[3] **Latimer,** *Eighteenth-Century Bristol,* 1893, p 74.
[4] **Evans,** *Chronological History of Bristol.*
[5] **Venn,** *Biographical History of Gonville and Caius College.*
[6] **Johnson,** *Bristol Corporation of the Poor.*
[7] **Thomas Dover, M.B.,** *The Ancient Physician's Legacy to his Country* (seventh edition, p. 107).
[8] *Annalia Dubrensia* (Vyvyan, 1878).
[9] **Rudder,** *New History of Gloucestershire* (1779).
[10] **Rudge,** *History of the County of Gloucester* (1803).
[11] **Munk,** *Roll of the College of Physicians.*

VOMITING CONNECTED WITH ANÆSTHESIA.[1]

BY

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IN an endeavour, which has recently been made at the Royal Infirmary, to reduce the frequency and to diminish the severity of vomiting associated with general anæsthesia, the methods adopted of preparing the patients and of administering the drugs have, we think, produced results, sufficiently definite and encouraging, to justify our bringing the matter before the notice of this Society, in the hope that members may give us the benefit of their experience, especially as regards post-anæsthetic vomiting, and may thus help us to deal with those cases, namely 37 per cent. of all, in whom, at present, sickness seems to be unavoidable.

Our series of cases consists of 500 patients, operated on in the two main theatres, taken consecutively. And notice is taken of all vomiting, including the ejection of mucus, which occurred during the twenty-four hours following the induction of anæsthesia.

The results were as follows :—

	Vomited.
In all	37 per cent.
After consciousness returned	5 per cent.
After twelve hours from end of operation ..	2½ per cent.

[1] Read before the Bristol Medico-Chirurgical Society on December 9th, 1908.

Besides being a source of suffering to the patient and of annoyance to the surgeon, vomiting may lead to very serious complications, such as syncope or pulmonary affections.

The circulatory depression which precedes emesis is generally transient, and disappears when the act of vomiting is over. But in certain cases, especially in those recovering from chloroform anæsthesia, this faintness may prove, and has proved, fatal; a result which is not to be wondered at when one realises that, for the time being, the patient shows many of the cardinal signs of shock, namely pallor, cold and clammy condition of skin, shallow respiration, rapid and extremely soft pulse, and sometimes insensitive cornea or dilated pupils; the order of events which culminate in the fatal result being probably (1) depressed respiration or—if retching occur—closure of the glottis, (2) consequent imprisonment in the body of chloroform vapour and carbon dioxide, and a coincident deprivation of oxygen; these factors, of course, constituting a relative overdose of chloroform.

A similar train of incidents may occur at any moment when the anæsthesia is unduly light, and probably bear an important causal relationship to the occurrence of many deaths in the induction stage of chloroform anæsthesia, 50 per cent. of the deaths which occur under chloroform taking place in this stage.

The tendency to vomit, especially when the patient is but lightly "under" at the commencement or end of anæsthesia, is greatly increased by any movement of the trunk—as from one table to another, or as in rolling over for bandaging.

It is my belief that post-anæsthetic bronchitis and pneumonia are caused by the inhalation of vomited matter more often than is generally supposed. One marked illustration of this occurred in my hands some months ago at the Infirmary, when a healthy man, aged 22, vomited mucus while being rolled over for bandaging after operation for hernia. The act of vomiting was extremely sudden and forcible, and the following inspiration was heard to draw fluid into the windpipe. The stethoscope immediately revealed copious bubbling in the left chest, and twenty-four hours later the patient had developed left-sided broncho-pneumonia.

Measures by which vomiting and its complications may be to some extent obviated include (1) preparation of patient, (2) method of administering the drugs, (3) management of patient during anæsthesia, (4) management after operation.

(1) *Management of patient.*—In our series the method of preparation differed from the course usually adopted in the substitution of boiled or peptonised milk for the time-honoured beef-tea. The patients were in most instances allowed ordinary mixed, but plain, diet on the day preceding, but on the day of operation they had bread and butter and tea at 6.30 a.m., and at 9.30 from two to four ounces of milk, the operating hour being 1.0 p.m. In special cases milk diet was given during the day preceding operation. Repeated control experiments pointed to the desirability of omitting the usual beef-tea.

(2) *Administration.*—Where permissible anæsthesia was induced by gas or ethyl-chloride and ether, and was maintained by ether for the first twenty or thirty minutes, after which time as a rule chloroform and ether were given on a domette Murray's mask by the two-bottle method, the fabric being kept moist with ether from one bottle and the chloroform being added from the other bottle in very small quantities, one drop in every four, five, six, or even seven breaths being sufficient to maintain an even anæsthesia. The total quantity of chloroform used being often as small as four or five drams per hour. This two-bottle system has many advantages, and has been used by some administrators at the Infirmary since 1895; and in this connection it is interesting to note that Tyrrell, in introducing his two-bottle Junker apparatus in 1897, claimed as one of its advantages a diminution in the frequency of vomiting.

Management during anæsthesia.—Unfortunately our patients had to be lifted from the anæsthetic to the operating table, and thence to the stretcher, and finally from the stretcher to the bed, and we feel that much might be done to eliminate some of this movement and jolting.

Management after operation.—To avoid vomit being inhaled, and to prevent cyanosis from tongue obstruction, every patient should (where permissible) be kept on his side until fully conscious.

There still seems to be a regrettable deep-seated tendency among nurses to regard the supine as the normal post-operation posture.

Mr. S. V. STOCK said that he could fully endorse the value of Mr. Flemming's methods, particularly the substitution of milk-feeds for beef-tea before operation. Prolonged fasting was bad. A sister at a children's ward had remarked to him that occasionally children preparing for operation refused to take the milk-feed during the morning before operation, and such children nearly always vomited; only a small proportion vomited of those who took the milk. Lavage of the stomach would not always prevent vomiting if the operation was protracted. He would always wash out the stomach before, rather than after, the patient was anæsthetised.

Mr. HEY GROVES said that movement of the patient could not always be avoided; the "fear of the table" made it necessary in some cases to administer the anæsthetic elsewhere than on the operating table. After the operation patients do not vomit until the anæsthetic is stopped; therefore he advised keeping them fully anæsthetised until the bandaging was finished and the patient returned to bed. He had a high opinion of adrenalin solution in treating post-operative hæmatemesis.

Mr. PAUL BUSH suggested that the patient should be anæsthetised in an adjoining room upon the actual operating table, which could then be wheeled into the theatre.

Dr. SYMES maintained that the duration of the operation influenced the frequency of vomiting, which was the result not only of the drug administered but also of the nervous shock. This shock was proportional in some measure to the length of the operation; moreover, nervous people often experienced nausea and even vomiting after administration of nitrous oxide. Two drugs, morphia and atropine, administered in water before the operation appeared each to lessen vomiting.

Dr. BERTRAM ROGERS inquired whether the various commercial methods of preparing chloroform or ether could be said to affect vomiting.

Dr. OGILVY drew attention to the proneness of ophthalmic cases to vomit during the course of operation.

Dr. FORTESCUE-BRICKDALE remarked that beef-tea stimulated gastric secretion, and would on that account be more likely to contribute to vomiting than milk.

Mr. LACE quoted the experience of a colleague who had found that the administration of nothing but peptonised milk for twenty-four hours before operation diminished the chances of anæsthetic vomiting, and on inquiry he had found a consensus of opinion among nurses to the same effect.

Mr. FLEMMING in reply said that preliminary lavage of the

stomach sometimes gave the anæsthetist a false sense of security. In fæcal vomiting it was useless, for during a long operation regurgitation into the stomach provided fresh material to be vomited. The suggestion of anæsthetising patients on the operating table would only affect the vomiting during induction of anæsthesia. He objected to the preliminary use of morphia or atropine on account of the difficulties they introduced during anæsthesia. As to the use of acetone chloroform, he thought that with the addition of sufficient ethyl chloride to render the evaporation point stable it was a safe anæsthetic, but he preferred to administer a preparation about which there was no doubt.

MILK FROM A PUBLIC HEALTH STANDPOINT—CITY OF BRISTOL.[1]

BY

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THE city numbers 377,642 persons, and covers 17,289 acres or 27 square miles. The milk supply of the city is derived from 381 farms, through 1,000 dealers. Of the 381 farms, 81 are within the present city limits, and 300 outside the limits, scattered over the counties of Gloucester (134), Somerset (146) and Wiltshire (20). One inspector of dairies, cowsheds and milkshops is appointed to cover the whole of the city area, with a workman assistant, who revisits and reports neglected work, &c. In 1897 and 1904 the city extensions added a considerable rural area containing 79 dairy farms; 36 of these were added in 1904 to the existing city area, but the additional inspectors then advised for these districts have not yet been appointed. The Report of 1904 advising this is still under the Committee's consideration.

By-laws and Regulations in force in the city.

(*a*) The Dairies, Cowsheds and Milkshops Order, 1885, and the Amending Order of 1886, control the conditions of the milk service generally.

[1] This and the following papers on Milk were read at a meeting of the Society on February 10th.

(*b*) Regulations made by the Council on October 23rd, 1905, prescribe details as to air space, lighting, ventilation, water supply, drainage, &c.

(*c*) The Bristol Corporation Act, 1905, deals specially with tuberculosis.

Inspection, &c., in the city.

The number of general inspections made in the city during 1907 was 2,379, and a similar number is paid in each year.

In addition special inspections by an Assistant Medical Officer have been ordered of all the dairy farms upon three occasions, viz. in 1897 and 1900, and the third special inspection, which includes also dairies and milkshops, is now in course of completion.

Considerable improvement has followed each of these special visits, especially at dairy farms which have from time to time been included in the city limits owing to extension of the boundaries.

In 1899 a systematic examination of the milk from all farms supplying the city was carried out by Professor Délépine. Out of seventy-four samples examined biologically only four showed the presence of tuberculosis. The samples were taken from the milk as brought into the city for delivery.

Milk contracts for the city and port hospitals contain clauses protective against tuberculosis.

The Health Committee has recently ordered a further special examination of the milk supplied to the city, which has been entrusted to University College Laboratory.

Observations in regard to inspection of milk generally.

Common sense should govern this as other matters upon which public sentiment is apt to run wild.

Cleanliness at dairy farms is essential: the most difficult point is to secure cleanliness of the cows' teats, second to this to secure cleanliness of the milkers' hands, and the special danger of typhoid fever from "carrier" milkers by hand infection is obvious.

Milk-carried outbreaks will not be entirely suppressed by complete methods of ordinary cleanliness, as they are often due

to infection from very slight cases which are "missed," and so gain added opportunity for mischief.

Milk should be obtained, carried and retailed with as much attention to cleanliness as possible, but this will not remove the inherent inadvisability of consuming an animal secretion raw. All milk should be cooked, just as animal flesh is cooked.

Milk and infant mortality.

Absolute cleanliness, avoidance of preservative drugs, and care in handling and storing should mean some lessening in infant mortality; but domestic dealing with milk has to be reckoned with as well as the dealings of cow-keeper and dairyman.

Also the cleanest of milk improperly given to infants as a substitute for mothers' milk, either in too concentrated a form or mixed with unsuitable food, will account for a proportion of illness.

Home advice with personal teaching is the most hopeful method to deal with this.

Relatively the infant mortality and the diarrhœal mortality in Bristol is satisfactory in comparison with the large towns.

TOWNS OVER 200,000.

1907.

Name of Town.	Infant Mortality per 1,000 births.	Death Rate per 100,000 living from Diarrhœa.
London	116	40
Liverpool	144	73
Manchester	146	50
Birmingham	147	43
Leeds	130	38
Sheffield	145	99
Bristol	**100**	**32**
West Ham	131	66
Bradford	124	17
Newcastle-on-Tyne	123	14
Hull	127	37
Nottingham	165	63
Leicester	131	31
Salford	140	44
Portsmouth	123	29

THE ADULTERATION OF MILK IN BRISTOL.

BY

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THE composition of milk may be regarded as varying between 12 to 13 parts of total solid matter, and the fat of this amount between 3.3 and 4.3, and the non-fatty solids between 8.5 and 9 parts. The constituents of the non-fatty solids are not taken into account in judging the purity of milk samples under the Food and Drug Acts, and the percentages of lactose, proteid and ash are not therefore usually determined. The first standard suggested by the Society of Public Analysts in 1875 was, fat 2.5 per cent., non-fatty solids 9.0. The solids were determined by drying 5 or 10 cc. in a platinum dish to a constant weight, and then extracting the fat from this portion by means of dry ether; by this means the fat was never completely extracted, and hence a low minimum for fat and a higher for solids were at first fixed. About ten years later, with the introduction of improved processes of analysis, such as the Adams, Schmidt and others, the figures were altered to 2.7 fat, and 8.5 solids other than fat. No figure has ever been fixed for total solid matter. This standard was a possible minimum for the milk of a single cow, but the work of Vieth and Richmond showed that the genuine milk of a mixed herd did not fall below 3 per cent. except in an infinitesimal percentage of abnormal specimens; the Board of Agriculture, therefore, adopted the present standard of fat 3 per cent., non-fatty solids 8.5 per cent. at the beginning of this century. All samples condemned under the Food and Drug Acts fall below this standard. This standard is very much exceeded as regards fat at all times of the year, except in the spring, while as regards solids other than fat the spring is the high period.

It is not usual in genuine milk to find a sample approaching either limit in which the other limit is not greatly exceeded.

The total solids of genuine milk should not be less than 12.0 per cent. When I first undertook analyses of Bristol milk, I was struck by the number of samples which were of bare legal quality, and I was at once led to conclude that it is a practice here amongst skilled adulterators to add the requisite amount of separated milk and water to genuine samples of good quality in order to produce milk which would just pass the analyst. In this they occasionally fail, and hence the high Bristol figures for adulteration. The following are the numbers of the last two years :—

Examined.	Adulterated.	Per cent. condemned.	No. watered.	No. deficient in fat.
650	82	12.9	18	63
647	101	15.8	36	63

The increase of 3 per cent. in the adulteration figures is shown to be entirely due to the addition of water, and as some of the samples so condemned contained only 3 or less than 3 per cent. of fat, I have no doubt that many of these are the result of skilful manipulation to produce legal milk which just failed in its object.

The only satisfactory result in recent years in the milk supply of Bristol is the reduction in the use of preservatives. I have never found formaldehyde ; and the samples condemned for boric acid, which amounted to twenty, three years ago, during the last two years have only amounted to three.

SOME IMPURITIES OF VENDED MILKS.

BY

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THROUGH the courtesy of a colleague, it has been possible to examine some 240 samples of Bristol milk collected under good conditions. Advantage was taken of this opportunity to

determine the cell contents, the amount of dirt, and the treatment of the milk prior to exposure for sale.

1. *The cell contents of vended milks.*

A considerable amount of evidence has been accumulated upon the leucocytes of milk obtained direct from healthy and diseased cows. It shows that milk from the same cow varies from day to day, and that the hours of milking, pregnancy and drying off, all influence the cell output. When mastitis is present the number of leucocytes is materially increased, and probably a large percentage are pus cells. It has been found impossible, however, to distinguish a breaking-down leucocyte from a pus cell. Attempts have therefore been made to establish an arbitrary standard as to the number of leucocytes sufficient to warrant a diagnosis of pus. Few of these standards have been accepted, but Savage, who has worked long at this question, considers that a count of more than 800 leucocytes per c.cm. calls for an inquiry into the source of the milk.

The value of these counts is not definitely settled, but there are indications that the method may attain general application. When this is the case, an augmented Public Health staff will direct attention first to vended milks, and later to the milks of individual cows. It seemed desirable, therefore, to investigate the condition of vended milks from this standpoint, and to determine how far the obvious complicating factors might influence the results.

The method employed was that advocated by Savage (*J. Hygiene*, 1906, vi, 123), and the average time elapsing between the milking and examination was about twelve hours.

For purposes of comparison, and in order to obtain some idea of the action of time on the breaking up of the leucocytes, several samples of human milk were counted. The figures quoted in Table I. state the counts of the cell contents of human milk, and the percentage decrease of the cells when the milk is kept in sterile vessels. The increased number of cells in the milk obtained from a case of mammary abscess is also indicated.

TABLE I.

CELL CONTENTS OF HUMAN MILK.

Day after parturition.	Time after withdrawal, 5 hours.	Time after withdrawal, 15 hours.	Time after withdrawal, 45 hours.
	per c.cm.	per c.cm.	per c.cm.
4	75	50	45
5	50	40	30
7	70	60	50
11	170	—	120
Case of mammary abscess			

Counts made from cows at a farm in the neighbourhood yielded similar results.

When milk is exposed for sale, the debris and cells tend to be deposited at the bottom of the receptacle, while the cream rises to the top. Table II. shows this difference, and indicates that for the enumeration of cells it is necessary to stir thoroughly before taking the sample of milk.

TABLE II.

CELL CONTENTS OF VENDED MILKS.

	Number of leucocytes per c.cm.
Upper layers	31.8
	119.3
	87.5
	43.7
Lower layers	1718
	839
	2883
	8034
	3560

If we accept the arbitrary standard of 800 leucocytes per c.cm. laid down by Savage for freshly-drawn milk, and allow for the average breaking down of cells, we arrive at something like 500 as a working standard for vended milk. In such a case, fourteen of the milks (6.5 per cent.) whose counts are recorded in Table III. deserved further inquiry with regard to the cause for the increase.

TABLE III.

CELL CONTENTS OF VENDED MILKS.

Number of leucocytes per c.cm.	Number of milks examined.
Under 20	137
20–40	18
40–60	10
60–100	13
100–500	22
500–1000	5
1000–2000	3
Over 2000	6

With these mixed milks it has to be remembered that a high cell content in the milk from one cow may be modified by by a very low one from another animal, so that as a general rule an average will result. When, therefore, the count exceeds the average the indications for inquiry are quite definite. On the other hand, this averaging permits the overlooking of a number of milks with high counts, and the percentage of questionable milks thus appraised is far too low.

There is much to be learned from the microscopical characters of the cells and organisms of milk; but it is, after all, a sorry substitute for the continuous inspection of the animals and their attendants which our laws ought to enforce. The proverbial straining at gnats and swallowing of camels is well exemplified in this matter, for we possess a magnificent organisation for detecting trifling additions of water and almost harmless preservatives, but concern ourselves little with the pus, infective organisms, objectionable fæcal dirt, hairs, animalcules, and sputum which have become the usual constituents of the milk supplied to large cities. It is at the source of the milk that our energies should be expended, and every sample collected for compliance with the Adulteration of Foods Act is a glaring impeachment of our national neglect to control our milk supply by an adequate number of sufficiently-empowered trained inspectors, and of our cowardliness in postponing legislation on a subject of supreme importance to the health of the people.

2. *Dirt in milk.*

The standards for the determination of the amount of dirt in milk vary considerably. In this instance the method followed has been that suggested by Délépine (*Med. Chron.*, 1908, xlvii, 473). It is a remarkable tribute to the recent advances in milk inspection that in Manchester and several large cities the percentage of dirty milks has fallen from 12.5 in 1896—1900 to 4.9 in 1906.

TABLE IV.

THE INCIDENCE OF AN EXCESSIVE AMOUNT OF DIRT IN MILK.

Date, 1908.	Number of milks examined.	Number of milks containing excessive amount of dirt.	Per cent.
January	29	5	7.2
April	7	2	28.5
May	14	2	14.2
June	44	11	25

3. *Acidity of milk.*

The following table shows the amount of acidity developed in summer milk. The average acid found in locally pasteurised milk is about 12 D/N alkali per 50 c.c. The increased acidities here recorded afford an indication of the bacterial growth in the milk exposed for sale.

TABLE V.

THE ACIDITY DEVELOPED IN MILK PURCHASED DURING MAY, JUNE AND JULY.

Average normal acidity in terms of D/N alkali—12 D/N per 50 c.c. milk.

42	samples	yielded	an	acidity	of	25	D/N	alkali per 50 c.c. milk.
18	,,	,,	,,	30	,,	,,	,,	,,
7	,,	,,	,,	49	,,	,,	,,	,,
6	,,	,,	,,	50	,,	,,	,,	,,

4. *Treatment of milk before exposure for sale.*

Following the methods recommended by Proskauer, Seligmann and Croner, in their admirable report upon the Danish milk sold in Berlin (*Ztschr. f. Hyg.*, Bd. 75, 1907), of seventy-three milks examined during May, June and July, 1908, at least 17.8 per cent. of the milks had been heated to over 80° C. prior to sale. This fact suggests that a considerable amount of badly cooled or old or doubtful milk was then on the market.

TABLE VI.

THE TREATING OF MILK PRIOR TO SALE (73 Samples examined).

Heated over 80° C.	Residual Coagulation test.	Oxydase test.
13 ..	60 ..	negative in 29 samples.

It may be safely inferred that even the most sceptical will admit that such results as these merit the attention of the health authorities. The tendency of modern hygiene is to deal with the sources of evils as well as with the evils themselves, and the question of milk supply, rather than milk adulteration, demands our present serious attention.

PASTEURISATION AND OTHER METHODS OF PURIFYING MILK.

The advantages and disadvantages of Pasteurisation may be summarised as follows :—

Pasteurisation at 60° C. for twenty minutes kills non-sporing pathogenic microbes.

Pasteurisation at 60° C. for twenty minutes does not destroy all the ferments.

Milk Pasteurised at 60° C. for twenty minutes is a good food for children over 3 years of age.

Pasteurised milk contains a large number of spore-bearing and often dangerous microbes.

Pasteurised milk is a better medium for bacterial growth than is raw milk.

Pasteurised milk is not a good food for children under 3 years of age.

Pasteurised or purified milk is not so good as pure milk.

Pasteurisation does not prevent contamination ; the heated milk must be used more rapidly than raw milk.

Pasteurisation perpetuates ignorant and uncleanly collection and transport of milk.

Theoretically, Pasteurisation cannot be recommended. Practically, it is the best safeguard against unclean milk which we possess ; but it is a safeguard only because we do not control the sources of our milk. In this way it has constituted a serious barrier to progress, for the name has become a fetish. Why in these days is it necessary to reiterate that the process destroys the natural bactericidal characters of milk, does not kill off all the bacteria, nor remove all the filth of the farmyard ? Why should the producer be asked to keep his cows and attendants clean and his herd free from tuberculous cattle ? Because we are so frequently told that " everything that gets into the milk is removed, neutralised or killed during Pasteurisation." This is the attitude which is so widely adopted, but it is a wrong one. Pasteurisation is a good method for dealing with dirty milk, but it is not infallible. Its efficacy is only proportional to the cleanliness of collection.

It may be of value to here refer to the valuable work recently carried out at the instance of the joint Committee of the Councils of the County Boroughs of Bradford, Hull, Leeds, Rotherham, Sheffield, and the East and West Ridings of Yorkshire by Dr. Orr. He has shown that it is at the farm where the larger number of organisms and amount of dirt is added to the milk, his examinations made upon the same samples of milk at the different stages of their transfer from the animal to the consumer proving that during railway or car transit, and at the retailer's premises, only small amounts of organisms are added.

Bearing these findings in mind, I have endeavoured to define for myself the attitude of Bristol purchasers of milk, and, thanks to the kindnesses of several colleagues, I am able to append the conditions of the purchase of milk at some of our large institutions. These details have been arranged in Table VII upon the lines of the plan devised by the Liverpool Medical Institution, and for the opportunity to avail myself of this document I am indebted to Drs. Shingleton Smith and Emrys-Roberts.

TABLE VII.

CONDITIONS OF PURCHASE OF MILK BY SEVERAL BRISTOL INSTITUTIONS.

	A	B	C	D	E	F
Source	Dairy	Farm	Dairy	Farm	Dairy	Dairy
Quality of milk ..	Pasteurised	Fresh milk	Pasteurised	Fresh milk	Pasteurised "special"	Pasteurised "special"
Cooling and transit	No mention	No mention	No mention	No mention	Partial	Partial
Buildings, sanitation, water supply	No mention	No mention	No mention	No mention	Inspected	Inspected
Attendants' regulations	No mention	No mention	No mention	No mention	Partial	Partial
Tuberculosis and tuberculin test	No mention	No mention	No mention	No mention	No Inspection	No Inspection
Treatment of milk at Hospital ..	Unused portion boiled	Pasteurised	None	None	Inspected on arrival None	Inspected. None
Methods of enforcing contract	—	—	—	—	—	—

The point that has been advanced in connection with Pasteurisation is well borne out by this table. The layman is acting up to his best business knowledge when he contracts for Pasteurised milk. If he were made aware that the insertion of other clauses in his contract would result in a purer milk supply, there is not a shadow of doubt but that he would at once adopt them. Were it also made clear to him that a cleanly collected, rapidly cooled milk, delivered in cooled cans, is a much superior milk to the ordinary Pasteurised commodity, he would certainly use the extent of his purchasing powers to obtain the conditions deemed necessary. Table VIII (taken from the work of Evans and Cope, *Univ. Penna. Med. Bull.*, 1908, xxi, 264 (clearly demonstrates that unheated milk restrains the growth of added organisms, while heated milks form a more favourable medium for bacterial proliferation.

TABLE VIII.

THE PERCENTAGE INCREASE OR DECREASE OF BACTERIA WHEN ADDED TO STERILE COLLECTED MILK UNDER VARYING CONDITIONS.

STERILE MILK.

The addition of	Unheated.	Heated to 55° C.	Frozen.	Pasteurised 68° C. for 20 minutes.	Sterilised for 30 mins. at 100° C.
	per cent.	per cent.	per cent. in 4 HOURS.	per cent.	per cent.
Streptococci	−3.5 ..	−20 ..	−7 ..	+25 ..	+10
Staphylococci ..	−20 ..	+4 ..	+40 ..	+15 ..	+100
B. Coli Comm. ..	−40 ..	+10 ..	— ..	+100 ..	+2000
B. acidi lactici ..	+6 ..	+250 ..	+55 ..	+1000 ..	+3500
B. subtilis	+5.5 ..	+2.5..	+20 ..	+85 ..	+450

The mere diffusion of this information in the Press will not evoke much interest. A better result might be expected if it were possible to arrange for a meeting with the large purchasers of milk. At such a conference the many difficulties connected with milk production and supply might be fully discussed, and the ventilation of various views on the subject could not fail to broaden the general conception of the question. The results of the conference would then gain a wider consideration by the general public, would assist the local Health Committee in their prospective arrangements for scientific aid in hygienic problems, would guide the Medical Officer of the Local Government Board in his ideas for the framing of the much wanted Act for the regulation of milk supplies, and would constitute an important advance towards the education of those who transfer the milk from the cow to the consumer.

I am glad to have the opportunity to express my thanks to Drs. E. Russell and Fleck for material, and Dr. Carey Coombs and Mr. K. Girdlestone for laboratory assistance.

THE VALUE OF SOME LACTIC ACID FERMENTS.

BY

Drs. WALKER HALL and W. A. SMITH.

THEY showed that there is a great variability in the activity and power of the individual tablets sold commercially, and that a large number of the preparations are inert. Speaking generally, it appeared that when raw, pasteurised or partly-sterilised milk is kept at blood-heat for ten to twenty hours the same amount of acidity is developed as when tablets of lactic acid ferments are added. The organisms contained in the tablets seem to require a considerable time to overcome the normal and abnormal organisms of milk, and the development of their powers is so slow, that for the purposes of lactic acid therapy they are of little avail. Few of them grow well in artificial gastric juice, and when mixed with an emulsion of fæcal anaërobic and aërobic bacteria only two

out of ten types were alive after five days' incubation. It was pointed out that more satisfactory results may be obtained with living cultures, but that it is necessary first to subject the organism to aërobic and anaërobic special enrichment media; by these means cultures had been obtained which appeared in the fæces within twenty-four hours after administration by the mouth. Before lactic acid therapy is undertaken it was found advisable to ascertain that the fæcal anærobes are in excess; otherwise the administration of lactic acid bacilli may be harmful rather than curative. The authors of the paper found that 5 c.c. of a twenty-four hours' growth of a strong culture in their enrichment medium given in the early morning and late evening sufficed to guarantee the presence of the lactic acid bacilli in the intestine for a week. This was made easy of demonstration by a simple method of isolation, which they described. This weekly dosage, it was claimed, would make the treatment a definite one, would save a considerable amount of trouble as compared with the daily souring of milk, and would reduce the dangers associated with the sterilisation and incubation of milk. In addition, the cost of treatment would be diminished, as it would be unnecessary to prescribe the continuous taking of the ferment tablets. They also stated that if "soured" milk was desirable from the standpoint of digestion, the enriched cultures they showed produced in a shorter time a more finely divided curd than that which resulted from the addition of the dry tablets.

PRECAUTIONS TO BE OBSERVED IN ADMINISTRATION OF MILK IN DISEASE.

BY

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(*The following is an abstract of Dr. Clarke's remarks.*)

BEFORE dealing very briefly with special diseases, a few general points about milk require to be borne in mind. Speaking

generally, it is perhaps the most universally valuable nutriment in disease, and is most suitable wherever rapid growth or repair of tissue is taking place, as in children, young adults, and in convalescence from acute disease.

As compared with other proteid-containing foods, it calls out the smallest amount of secretion of gastric juice. The pancreatic juice secreted on a milk diet shows, however, a very high proteoclastic power; hence the digestion of milk proteids takes place chiefly in the intestine, and the work of the stomach is spared. The proteid of milk is readily assimilated, and more completely used up than any other form. The proportion of fat is large, and in a state of emulsion, which is partly the reason why milk is especially valuable in wasting diseases and some nervous affections. Putrefactive processes in the intestines are reduced, as is also the quantity of uric acid excreted. On the other hand, some persons have such an invincible repugnance to or distaste for milk, that they find it impossible to take it.

On a pure milk diet, to obtain the requisite amount of calories a very large quantity of fluid must be taken. Three pints of milk, generally regarded as the minimum daily quantity, only contains sixty to seventy grammes of proteid, and this is not a sufficient amount for more than two or three weeks. To obtain the full amount of calories needful, five to six pints of milk must be taken daily. Besides the inconvenience of taking such a quantity of fluid, there is an excessive flow of urine, and in many persons uncomfortable peristaltic movements of the intestines. In the gastric digestion of milk, the dense and tough clots formed are often difficult of digestion, and cause epigastric discomfort or pain. Constipation is a well-known consequence of a milk diet in many persons. Two other drawbacks to milk are its low content of chlorides and of iron. From the former may arise disturbance in the osmotic processes of the body, and from the latter anæmia.

To turn to the drawbacks to the use of milk in gastric and intestinal affections. It must first be remembered that milk is not strictly speaking a fluid food, that it forms peculiarly dense masses of tough curd in the stomach, and that these are

largely carried on into the intestines. Even when milk-digestion is well carried out—and in many persons this is a difficult matter—the fæces on a pure milk diet are bulky, and if large quantities are taken there is a probability that they will not all be properly dealt with, and that undigested curds will be passed in the fæces. In every case, therefore, in which a patient is on a pure milk diet the fæces should be frequently inspected.

In many cases of gastritis, or various forms of neurotic dyspepsia, a course of milk diet gives excellent results; but in most it is advisable to add to the milk something to render the precipitated curds more flocculent, such as citrate of soda, lime-water or barley-water, or it may be peptonised. In cases of this class the important factor in the cure is that milk makes so little demand upon the gastric glands. In cases of gastric ulcer milk alone as the staple diet, even when one of the above adjuvants is added, is not so satisfactory. Recent observations have shown that it is difficult to maintain nutrition adequately on the reduced amount of milk that such patients can, as a rule, take without discomfort; consequently that the ulcer does not heal quickly, pain and other symptoms persist, and convalescence is protracted. Further, the large amount of fluid on a purely milk diet is disadvantageous by distending the stomach. A dietary containing more fat and proteid and less water, such as Lenhart's, conduces to a more speedy recovery; the nutrition is well maintained, the patients put on weight, and the protracted convalescence so often seen in cases of gastric ulcer treated for weeks on a pure milk diet is abolished. The fat in milk, being an emulsion, has probably no effect in reducing the excessive secretion of HCl generally present in ulcer.

Diseases of the stomach attended by dilatation, from whatever cause the pyloric obstruction may arise, are also not suitable for a pure milk diet, although they may do well on small amounts of milk for a few days in beginning a course of treatment, because such stomachs are unable to dispose of the large quantity of fluid involved.

Similar objections apply to the use of milk alone in enteric fever. In the first place, something should always be added to

the milk to render the curds more flocculent; and, secondly, it should be remembered that there is a more bulky residue in the intestines from milk than from many other forms of proteid-containing food. Then again it is impossible to adequately maintain the patient's nutrition on milk only through a long illness such as enteric fever. In enteric fever the milk curds may escape digestion, undergo putrefactive changes in the intestines, giving rise to excessive tympanites, or even to the absorption of toxic matters. Whenever there is much tympanites in enteric fever, the digestion of the milk used should be looked to, and it will often require to be peptonised. For many years I have given other articles of diet from the beginning of the illness in enteric fever, and I think that the patients have in consequence made a better and more speedy recovery, and had a less protracted convalescence. Whether they have shown less tendency to thrombosis of veins I cannot positively say. In convalescence milk can be given freely in addition to the other food, and is generally well digested.

In acute nephritis an absolute milk diet is undesirable because of (1) its high proteid content, and (2) the large amount of fluid involved to obtain a sufficient quantity of nutriment. Three pints of milk per diem is generally regarded as the minimum amount, and this contains sixty to seventy grammes of proteid, an insufficient quantity for the daily needs for more than two to three weeks, and too much water. Later, when the case has passed into a less acute stage, and the kidney begins to secrete water well, more milk can be given. Von Noorden, therefore, recommends the addition of cream in order to obtain the requisite number of calories from a smaller amount of milk. He also advises the addition of calcium carbonate to combine with the phosphoric acid of milk, which is badly excreted by the kidneys.

Albuminuria is not to be regarded as an indication for a pure milk diet. Albuminuria is in some cases a sign rather of past damage to the kidney than of actual and increasing mischief, and in such patients a mixed diet is best adapted to maintain their nutrition. In chronic parenchymatous nephritis, although some remarkable recoveries are recorded in which the patients

lived for two years or more on milk only, the majority would neither tolerate such a diet nor do well upon it.

In contracted granular kidney the chief concern is to maintain the heart, and this is best done on a mixed diet. In most affections of the heart, and in diseases like pneumonia, which throw a heavy strain upon the circulatory mechanism, it is hardly necessary to say that a pure milk diet is unsuitable, because of the large amount of fluid that must be taken.

THE HEATING OF MILK AS IT AFFECTS THE NUTRITION AND HEALTH OF THE INFANT.

BY

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[ABSTRACT.]

THIS paper deals with the alterations in the physico-chemical character of milk produced by heat, not with the effect on bacteria or their products. These alterations may be described in three groups. The first group consists of the obvious changes, namely the changes in taste and colour (due to action of heat on lactose), and the formation of a " skin " (due to drying of protein on the surface, and not peculiar to milk). These changes are not of great importance as regards the infant. The next group consists of changes not appreciable by the ordinary observers, namely the precipitation of calcium, and alterations in the organic phosphorus compounds. The former renders the caseinogen less coagulable *in vitro*, but it is not certain whether the same effect is produced *in vivo*. It appears, however, that heated milk is less easily acted on by pepsin and trypsin, and in all probability less easily absorbed, especially by young children. The physiological effect of the alterations in the phosphorus is not certain ; but as cows' milk is poor in organic phosphorus

bodies, and these seem very needful to the human infant, heating may be considered to act detrimentally in decomposing these compounds.

The third group of changes, the least easily detected of all, are those which concern the "vital" properties of milk. Enzymes, agglutinins and precipitins, bodies presumably of value to the infant, are destroyed, and phagocytosis by the milk cells abolished. The so-called bactericidal power of fresh milk, which is really more inhibitory than bactericidal, is also destroyed. This is a great loss from the point of view of infant-feeding. Finally, clinical opinion, especially on the Continent, is steadily coming to the view that clean fresh milk is better for infants than heated milk. Though infantile scurvy is rare, other disturbances—such as anæmia, constipation and pyelitis—are more frequently met with in children brought up entirely on sterilised milk.

Progress of the Medical Sciences.

SURGERY.

A great deal of attention has been paid lately to the **surgery of the large intestine,** and the boldness with which the gut has been short-circuited or removed has directed much interest to the anatomy, physiology, and surgery of this part.

Ileo-cæcal valve.—Many recent observations point to the great importance of this structure. What is its normal function, how does it act, and how is it related to various pathological processes, are all questions which so far are not fully answered. That it is not the double-lipped slit, so long made familiar to us by diagrams and dried specimens, has been shown not only by hardening it *in situ* by formalin injections, but also by Keith's[1] observations on the part immediately after death. He found that by pouring hot wax into the ileum the valve closed by a definite sphincteric contraction of the circular muscle-fibres which surround the end of the small bowel and are contained in the lips of the valve, and there is a great probability that the opening and closure of the valve is regulated by conditions which obtain either in the cæcum or in the ileum. Elliott[2] has

[1] *J. Anat. and Physiol.*, 1904, xxxviii, p. viii.

[2] Elliott, *J. Physiol.*, 1904, xxxi, 157.

shown that the valve is held closed by a tonic contraction, and that active contractions of the lower ileum are accompanied by dilatation of the ileo-cæcal sphincter. When the splanchnic nerves are stimulated, the intestinal movements are inhibited, but the valve contracts more firmly. There can be no doubt that the junction between small and large bowels is more of the nature of a muscular sphincter than a mechanical valve, and this opens up interesting problems as to the rôle played by this structure in intestinal obstruction.

The movements of the colon and its contents.—For a long time it has been known that fluids may sometimes traverse the intestinal canal in a reverse direction to the normal, quite apart from intestinal obstruction. This was exemplified, *e.g.*, by Weber's[3] patient—an hysterical woman who vomited a coloured enema within ten minutes of its administration. Then in 1894 Grützner[4] showed that insoluble particles, such as chopped hair, suspended in normal saline and injected into the rectum, could be washed out of the stomach within six hours. But quite apart from this reverse fluid stream, it has been shown that in a part of the colon there exists a reverse peristalsis, which must exercise a very notable influence over many of the phenomena of colic disease. This was noticed first by Jacobi[5] accidentally when he was operating upon the abdomen of a dog. It was systematically investigated by Cannon[6] in America in cats, by means of feeding with bismuth mixed with porridge, which food throws a shadow by the X-rays on the fluorescent screen. The contractions occur in groups about every fifteen minutes, each contraction group lasting five minutes, and consisting of anti-peristaltic waves occurring four or five times each minute. Elliott and Barclay-Smith[7] have abundantly confirmed these observations on a great variety of animals, by actually watching the intestines after the abdomen has been opened. The anti-peristalsis begins usually towards the middle of the transverse colon, and travels back to the cæcum. In the majority of animals under an anæsthetic the movements are only seen after the spinal cord has been destroyed. If this abolition of the movements by an anæsthetic obtains in man, it accounts for the fact that they have not been observed during operations. But Hertz,[8] Mummery,[9] and Groves and Walker Hall[10] have made observations which conclusively show that this marked wave of anti-peristalsis is the chief and predominant movement of the colon

[3] Weber, *St. Barth. Hosp. Rep.*, xxix, 34.
[4] Grützner, *Deutsche med. Wchnschr.*, 1894, No. 48, p. 897.
[5] *Arch. f. exp. Path. u. Pharm.*, 1890. xxvii, 147.
[6] *Am. J. Physiol.*, vi, 253. [7] *J. Physiol.*, 1904, xxxi, 272.
[8] *Brit. M. J.*, 1908, i, 191.
[9] *Proc. Roy. Soc. Med., Surg. Sect.*, March, 1909. [10] *Ibid.*

in its proximal part in the human subject. And it has been pointed out by the last-named author that this anti-peristalsis will account for the symptoms of distension and pain which occur in the partially excluded colon, and which often necessitate the removal of this part of the bowel after ileo-sigmoidostomy. That is to say, if the ileum is cut in two near its end, and one end joined to the pelvic colon, the ascending colon and cæcum do actually in many cases become blown up by the movement of anti-peristalsis forcing fluid and gas into the blind pouch.

The lymphatics of the colon.—The course and arrangement of lymph vessels and glands have been thoroughly worked out by Jamieson and Dobson.[11] The general arrangement corresponds very closely with that of the blood-vessels, and can, therefore, be divided into three sets connected with (1) the cæcum and ascending colon, (2) the transverse colon, and (3) the descending, iliac and pelvic colon. The first set, which accompanies the ileo-colic artery, are divisible into two groups, an upper which is adjacent to the duodenum, and a lower near the ileo-cæcal junction. Sometimes the lymph vessels run direct from the cæcum to the glands of the upper group without joining the lower, and this fact makes it desirable to remove the whole series right up to the root of the mesentery when excising any malignant growth. The lymph vessels of the terminal six inches of the ileum join freely with those of the cæcum and appendix. In addition to the glands along the ileo-colic artery, there is an important series of glands closely adjacent to the large intestine, and called the para-colic set. These are specially numerous along the inner border of the ascending colon, but become fewer on the transverse, and fewer still on the descending and pelvic colon. The lymphatics of the transverse colon are contained in the transverse meso-colon, and those of the descending, iliac and pelvic colon lie with the inferior mesenteric vessels behind the parietal peritoneum. Thus each part of the large intestine is associated with a lymphatic area which is of a fan shape, the apex of the fan being situated in the middle of the transverse meso-colon at the root of the mesentery.

Excision of malignant growths.—The principles which have so long regulated the extent of radical operations for breast cancer have been applied now to cancer of the colon. Jamieson and Dobson[12] and Bird[13] have each successfully removed the whole of the cæcum, ascending colon, with parts of the transverse colon and ileum, for growths of the right colon. And together with this wide bowel removal the whole of the fan-shaped piece of peritoneum with its lymphatics has been excised up to the root of the mesentery. Schwijzer has applied the same principle to the transverse colon, the meso-colon being so thoroughly removed

[11] *Lancet*, 1907, i, 1137.

[12] *Lancet*, 1908, i, 149. [13] Bird, *Lancet*, 1906, i, 440.

that the pancreas was laid bare. His patient was alive and well two years after the operation. But in addition to these two factors necessary for permanent success, *i.e.* extensive removal of bowel above and below the growth and removal of the associated lymph area, there is a third which it is becoming increasingly clear is of the utmost importance, as without it the others can often not be carried out. This is the performance of a preliminary colotomy, or better still an ileo-sigmoidostomy, before the excision of the growth is attempted. This is not merely to relieve the distension of the bowel, it also places the patient in a far better position to undergo the radical operation, and this latter can be done quite freely without the fear of not being able to bring the ends of the gut together. The comparison of the results of operations performed in one or two stages is very much in favour of the latter, as far as the immediate results are concerned, and it is only reasonable to suppose that the ultimate results will be still more strikingly in favour of the operation *à deux temps*. It may be taken for granted that every surgeon would naturally prefer to do the whole operation at one sitting, producing a more brilliant result; but, nevertheless, even those who admit this feeling have to confess that the two-stage operation gives much better results. Bozelius, for example, gives twenty-eight cases at Breslau treated by secondary excision with only four deaths, whereas cases treated by primary resection had a mortality of 50 per cent. Putting together the results in cases described by Morton,[14] Bozelius,[15] Kummel,[16] Hochenegg[17] and Schloffer,[18] there were twelve cases of primary resection with five deaths, a mortality of 42 per cent., and fifty-seven cases of secondary resection with five deaths, a mortality of 9 per cent. And when we consider that the cases chosen for primary resection are those presenting the most favourable conditions, this comparison is still more striking.

Functional diseases of the colon. Under this term may be grouped all those cases where constipation is the main symptom, but where there is no primary organic disease. It includes idiopathic dilatation of the colon, primary constipation of colic origin and some forms of membranous colitis. Between the two former it is impossible to draw any hard-and-fast line. At the one extreme are those cases in children in which in earliest infancy the abdomen is enormously distended by huge coils of colon and which are clearly congenital. At the other are cases of adults in whom constipation becomes more and more marked, and in whom the colon is found to be variously dilated, kinked and distorted. Lowenstein[19] has collected over 150 cases of

[14] *Brit. M. J.*, 1904, ii, 1149. [15] *Centralbl. f. d. ges. Therap.*, 1908, xxvi
[16] [17] [18] Quoted by Bozelius, *loc. cit.*
[19] *Centralbl. f. allge. Path.*, 1907, 929.

idiopathic dilatation from the literature, and he concludes that in some cases the disease is certainly congenital, but in others it is as certainly acquired. There are several points in which well-marked congenital cases differ from cases of acquired constipation with secondary dilatation. In the former the male sex greatly predominates, being in infants in the proportion of 7.1, and in adolescence 3.1. The growth and development of the chest is much stunted by the pressure of the abdominal contents during the time of growth, the abdomen is greatly distended and presents marked visible peristalsis, the general nutrition suffers early, and the end is almost always fatal. In the latter, on the other hand, the sex evidence is reversed, women being about six times more frequently affected than men, the chest is normal, the abdomen is but little distended, and active peristalsis is not seen, the general nutrition is maintained for many years, the subjects often being actually obese. In only a very few of these cases of primary acquired constipation in adults does a time arrive when the abdomen becomes distended and flesh and strength fail. As regards the treatment of all these cases a great deal has lately been done and written of which it will be possible here to give only the barest outline. Arbuthnot Lane[20] for years past has been advocating the surgical treatment by partial exclusion of the colon, and lately he has gone further and advised that the colon be in its greater part removed. It is very unfortunate that he has included in his series many cases of gastric ulcer and peritoneal adhesions following appendicitis—as these are clearly quite different from cases of simple chronic constipation. The mortality of 23 per cent. has shown that these heroic measures are only justifiable in the most extreme cases. Ito and Goyesima[21] and Tuffier[22] have also short circuited or excised the colon for conditions of dilatation, and their mortality is about 25 per cent.

Hertz[8] has shown by the X-rays, after bismuth feeding, that in many cases of chronic constipation the stasis occurs only in the pelvic colon, and that therefore in these cases to excise the upper portion of the large intestine would be to remove the only part that is working properly. One criticism may be urged against this, however, viz. that if the proximal part of the colon was excluded, the fæces would reach the pelvic colon in a liquid condition, with which it could deal much better than with solid masses. But it is certainly a point of great importance that the X-rays should be used systematically in these cases, in order to locate the position of stasis. Groves and Walker Hall[10] have shown that the metabolism was unaffected by exclusion of

[20] *Brit. M. J.*, 1908, i, 126.

[21] *Deutsche Ztschr. f. Chir.*, 1907, lxx.

[22] *Bull. et Mem. de la Soc. de Chir. de Paris*, 1907.

[10] *Loc. cit.*

the greater part of the colon or by its removal in two cases, and the former has brought forward evidence from those cases which demonstrate that in the partially-excluded colon anti-peristalsis occurs, which often so distends the bowel as to cause great pain and toxæmia from the stagnation of its contents. Mansell Moullin[23] points out that simple lateral anastomosis between the ileum and pelvic colon has given perfectly satisfactory results in several cases of dilated colon under his care, and that in none of these has he had occasion to excise the colon subsequently, as happens so often when the ileum has been completely divided.

The surgical treatment of colitis.—Previous to 1895 the colon had sometimes been opened on the left side to drain conditions of ulcerative colitis (Hahn,[24] Robson,[25] Robinson,[26] Olmstead[27]). Then Keith,[28] and a little later Golding Bird,[29] practised a right-sided colostomy, which serves to divert the fæcal stream from practically the whole colon. The results from this latter operation have been almost uniformly good; but it necessitates the artificial anus being kept open for at least six months, and the fluid discharge from this is a source of great discomfort. Gibson,[30] in 1900, introduced a valvular cæcostomy,

[30] Gibson, *Boston M. and S. J.*, 1902, cxlvii, 341.

in which the cæcum was opened in the same way as in Kader's gastrostomy. But after a brief but successful career this operation was succeeded in 1902 by Weir's method of draining the large intestine through the stump of the appendix, and surgical literature has lately been full of the praises of this operation.

Appendicostomy.—Ever since its introduction this operation has been employed for various conditions of colitis—mucous, membranous, ulcerative, dysenteric, and tuberculous—and all who have had experience of it speak in its favour. Weir,[31] Meyer,[32] Lilienthal,[33] Hutchinson,[34] Bennett,[35] Murray,[36] Dawbarn,[37] Moynihan,[38] Bishop,[39] Armour,[40] Lett,[41] Sumner[42] Waterhouse[43] and Keetley,[44] have published cases illustrating its method, and the last-named has carefully described its technique.

[23] *Lancet*, 1909, i, 156.

[24] Hahn, *Arch. f. klin. Chir.*, 1893, xxix, 395.

[25] *Lancet*, 1893, i, 1164. [26] *Ibid.*, *Tr. Clin. Soc. Lond.*, 1893, xxvi, 213.

[27] *Brit. M. J.*, 1906, ii, 1277. [28] *Lancet*, 1896.

[29] *Tr. Clin. Soc. Lond.*, 1896, xxix, 45; 1899, xxxii, 183; 1902, xxxv, 164; *Brit. M. J.*, 1899, i, 1,217; 1895, ii, 1559.

[31] *Med. Rec.*, 1902, lxii, 201. [32] *Med. News*, 1905, 405.

[33] Quoted by Olmsted, *loc. cit.* [34] *Brit. M. J.*, 1905, i, 1039.

[35] *Lancet*, 1906, i, 419. [36] *Ann. Surg.*, 1901, xxxiii, 579.

[38] [39] [40] Quoted by Lett. [41] *Treatment*, 1905, ix, 881.

[42] Quoted by Lett. [43] *Proc. Roy. Soc. Med.*, March, 1909.

[44] *Ibid.*

In the less severe grades of colitis it may act as an absolute cure, but in the more severe chronic forms of ulceration its results are not so lasting; and for such cases Pauchet and Prieur[45] have adopted the operation of ileo-sigmoidostomy with most excellent results. Keetley[44] has gone much further than other authors in extolling the possibilities of the operation, so that he even suggests that as much of the appendix should be preserved as possible in acute appendicitis, and fixed in the parietal wound for future use, in case the need for appendicostomy should arise. The possibility of using the stump of the appendix for saline infusion in cases of diffuse peritonitis is a very important point, and one the value of which is shown by cases described by Billington. And lastly, this operation has been employed in cases of obstinate constipation, both to wash out the large intestine and for the introduction of purgatives directly into the gut. So far the operation, performed in uncomplicated cases, has no mortality, and the results from it are so good that it will probably take its place as a most valuable addition to our means of treating various disordered conditions of the colon; and if in any case it is unsuccessful, it can be followed by the more severe measures of ileo-sigmoidostomy or excision.

Pericolitis and diverticulitis.—No account of recent work on the surgery of the large intestine would be complete without reference to this subject. But it has recently been so fully dealt with by Telling[46] in the pages of the *Lancet*, that it will only be necessary here to refer to some of the main points. The diverticula are almost always acquired, and are rarely found except in elderly people. Each diverticulum varies in size from that of a tiny pouch barely visible to the naked eye to that of a cherry. They are generally multiple, and may be present to the number of several hundreds. They are most numerous in the pelvic colon, and diminish in frequency in the higher parts of the bowel, so that they are rare in either the transverse or ascending colon. Each diverticulum consists of a pouching of the mucous membrane outwards through the thinned muscular coat, and a covering of peritoneum, except when the diverticula occur in the non-serous surface of the gut, when the latter is absent. In the great majority of cases they project into the interior of the appendical epiploicæ. When fully formed, such a diverticulum presents conditions, the pathological possibilities of which are exactly similar to those of the appendix vermiformis. These may be summarised as follows: (1) General peritoneal infection without perforation; (2) acute gangrenous diverticulitis; (3) local plastic peritonitis; (4) general perforative peritonitis; (5) adhesions to other viscera which may cause acute intestinal obstruction; (6) local abscess, which resembles

[45] *Arch. Prov. de Chir.*, No. 11, 1905.

[46] *Lancet*, 1908, i, 843, 928.

a left-sided appendicitis; (7) chronic sigmoid mesenteritis which ties the colon down to the pelvic wall in a mass of adhesions; (8) chronic sigmoiditis, forming a hard, annular fibrous mass resembling carcinoma, and producing, like the latter, chronic intestinal obstruction; (9) carcinoma may actually develop at the site of a chronic sigmoiditis. It is probable that many cases which have been described as cancer of the sigmoid are really examples of chronic inflammation round diverticula, and, indeed, this has been demonstrated in some museum specimens.

ERNEST W. HEY GROVES.

LARYNGOLOGY AND OTOLOGY.

Abnormal Pulsating Vessels in the Pharynx.—It is hardly necessary to direct attention to the importance of noting the existence of large and abnormal pulsating vessels in the pharynx, prior to operation on the implicated region, and perhaps especially in view of the frequency with which operations for the removal of adenoids are undertaken. These abnormalities, fortunately, are not common; but in this lies the danger, as their presence is but seldom suspected or sought.

Connal[1] recently showed a series of nine at a meeting of the Glasgow Medico-Chirurgical Society, and at the same time read notes of three others that he had observed. In some the pulsating vessel was bilateral. The condition was met with in six women, three men, and three young boys. The pulsating vessel is situated behind the posterior pillars of the fauces, and in most cases ascends to the naso-pharynx. In three cases the vessels were bilateral, and where unilateral the vessel was seven times on the right side, and twice on the left side. In eight cases the pulsation was marked, and gave the impression of a large vessel. In the three boys' cases—aged respectively six, ten and eleven years—nasal obstruction, with enlarged tonsils and adenoids, existed. In one of the boys the pulsation was bilateral and very marked, communicating a heaving impulse to the left tonsil, which was hypertrophied.

Connal reminds us that most observers have ascribed the pulsation to the ascending pharyngeal artery, but that Schmidt and Kelly attribute the abnormal pulsation to the internal carotid artery. Connal believes that these large pulsating vessels are sometimes the ascending pharyngeal, and sometimes a tortuous internal carotid artery. He further points out that there is sometimes a slight difficulty in detecting them. The movements of the posterior faucial pillars, and of the lateral walls of the pharynx, are apt to mask the pulsation, while in the slighter cases the movements of the tongue must be well under control.

[1] *J. Laryngol., Rhin. and Otol.*, 1908, xxiii, 130.

Bárány's Tests have been employed by Pike[1] in "an examination into the condition of the vestibular apparatus in a series of cases of deafness, of non-suppurative origin." The vestibular apparatus includes the membranous parts of the semicircular canals, with the utriculus and sacculus, and the contained endolymph. The semicircular canals are three on each side, viz. the horizontal, anterior and posterior, and the two latter lie at an angle of 45° with the sagittal antero-posterior diameter of the head; hence it follows that the plane of the anterior on one side coincides with the plane of the posterior on the opposite side, and vice versa. Now movement of the head causes movement of the endolymph in one or more of these semicircular canals, and the movement of the endolymph involves movement of the cupola, and thus stimulation of the special hair-cells of the eighth nerve, and as whenever the cupola is moved vestibular nystagmus is produced, provided the rest of the reflex path is intact. It is mainly by observing the nystagmus, after employing certain clinical methods, that we judge of the condition of the vestibular apparatus. The clinical methods employed have been (1) the turning reaction, *i.e.* observation of the nystagmus, produced after turning the patient on a revolving table ten times, and suddenly stopping; and (2) the caloric reaction, *i.e.* the observation of the nystagmus produced by syringing the affected ear with cool water.

The turning reaction.—If the patient sits erect during the turning, only the horizontal canals are affected. Having put on a pair of opaque spectacles, he is turned first to the right as the hands of a clock go, and the duration of the nystagmus produced to the left noted. The result is noted thus: 10 × R=25″ would mean that turning to the right ten times produced nystagmus to the left lasting twenty-five seconds. He is then turned to the left in the same manner, and the result noted.

By bending his head 90° either forward or backward or to the side as he sits in the revolving chair, the vertical canals, instead of the horizontal, will be in the horizontal plane, and will be affected on turning; and it is a law that each canal produces an eye movement in its own plane.

One infers that the vestibular irritability is normal when the nystagmus produced by turning to right and left has a duration of twenty-five seconds or over.

The caloric reaction.—This can be produced with either hot or cold water, or by cold air or ether vapour. To explain this reaction we must consider that the labyrinth is filled with a fluid at the body temperature, and cold water, for instance, acting through the bony wall will cool this fluid, and a current will be produced, as the fluid cooled will sink to the bottom, and hence the cupola will be moved. Pike states that he has only used cold

[1] *J. Laryngol., Rhin. and Otol.*, 1908, xxiii, 596.

water in the cases he tabulates, an attic cannula being passed into the meatus, and connected by a rubber tube with an ordinary Politzer balloon filled with cold water, so that the ear can be syringed and the eyes watched. It is best to make the patient gaze at you steadily, and then, on pressing the balloon, the nystagmus will be observed. The direction is not constant, but is most often towards the ill side.

Tweedie,[1] who has made "observations on the results of the application of Bárány's tests to deaf mutes," has also employed the **electric test,** *i.e.* the application of the anode and cathode immediately in front of the tragus of each ear, with a continuous current of from twenty to thirty volts, and one to two milliampères.

P. Watson Williams.

Reviews of Books.

A System of Medicine. By Many Writers. Edited by Sir Clifford Allbutt, K.C.B., M.A., M.D., and Humphry Davy Rolleston, M.A., M.D. Vol. IV, Part I. Pp. xiv, 764. London: Macmillan & Co. Limited. 1908.

Volume IV of the original *System* has now been divided into two. Twenty authors contribute some forty chapters on diseases of the Liver, Pancreas, Ductless Glands and Kidney.

Under the heading "Diseases of the Liver" there appears an entirely new article by Dr. Arthur Keith on "Hepatoptosis." Glénard, in 1872, found this condition in 20 per cent. of some 3,500 cases presenting themselves for treatment at Vichy. Many of these are incorrectly so classified, and are called partial only, whilst the true hepatoptosis is never an isolated condition, but always is part of a general sinking of the viscera, the condition now well known as visceroptosis (Vol. III, p. 860).

Another new article, that on "Biliary Cirrhosis," has been contributed by Dr. Morley Fletcher, and in place of the previous article by Dr. Fitz, of Boston, U.S.A., new articles on "Diseases of the Pancreas" have been written by Dr. Bosanquet and Dr. Newton Pitt. The authors do not write with any enthusiasm on the results of Cammidge's test, which they say has not given good results excepting in the hands of its inventor.

The article dealing with the "Thyroid Gland" is enriched by the addition of an entirely new account of myxœdema by Dr. George R. Murray, and the account of exophthalmic goitre by

[1] *J. Laryngol., Rhin. and Otol.*, 1908, xxiii, 592.

Dr. Hector Mackenzie has been re-written. It takes a long time to establish any new treatment on a satisfactory basis; accordingly treatment by means of the fresh milk of dethyroidised goats, or by the dried milk preparation, called Rodagen, are as yet only in the experimental stage, and hence there is still scope for the surgeon, although even in the hands of such a skilful surgeon as Kocher the operation is attended with considerable risk to life, and should not be lightly undertaken until every other means has failed to produce amelioration.

The volume concludes with over two hundred pages on "Diseases of the Kidney," a new article on "Nephritis" by Professor J. Rose Bradford taking the place of the previous one by Dr. Dickinson. It will be seen that this volume is to a great extent new, and not merely a reprint of the old edition. A very complete index by Dr. Jex Blake adds greatly to the utility of the work.

Tuberculosis in Infancy and Childhood: its Pathology, Prevention and Treatment. By Various Writers. Edited by T. N. KELYNACK, M.D. Pp. xiii, 376. London: Baillière, Tindall & Cox. 1908.

The editor believes that the study of tuberculosis in early life, as well as the organisation of ways and means to secure the prevention and arrest of the disease, are but in their beginnings. This handsome volume—the combined work of forty-one contributors—is an expansion of the symposium on the subject which constituted the July number of the *British Journal of Tuberculosis*, 1907. The writers are mostly well-known specialists, who give expression to the best of English and American opinion. Norwegian, Swedish, Swiss and French writers join in the work, so that it may be considered as international, giving everything of the latest as regards the protection of childhood and the solution of the tuberculosis problem. Thirty-nine chapters on as many different topics leave little more to be said as regards our present knowledge. It is not easy to select any one of these for special comment, the work is one for careful study rather than a cursory review, but the differentiation of bovine tuberculosis is, perhaps, one of the most important. On this subject Dr. Nathan Raw sums up his views as follows:—

(1) Tubercle bacilli of **typus humanus** produce pulmonary tuberculosis, tuberculous ulceration of the intestines, tuberculosis of the abdominal glands.

(2) Tubercle bacilli of the **typus bovinus** produce mesenteric tuberculosis, tuberculous peritonitis, tuberculous glands, tuberculous affections of the bones and joints, tuberculous meningitis, acute miliary tuberculosis, and probably lupus.

He further summarises our present position thus :—

(1) Human and bovine tuberculosis are different varieties of a common species.

(2) The human body is susceptible to both forms.

(3) Bovine tuberculosis is frequently conveyed to humans both by means of infected food and by contagion.

(4) These two forms of tubercle are antagonistic to each other.

(5) A mild attack of bovine tuberculosis protects against phthisis pulmonitis.

(6) Tuberculin from human sources has a marked effect on bovine lesions.

(7) Tuberculin from bovine sources has a curative effect on pulmonary tuberculosis.

The Alpine and American stations for tuberculous children are well described, but climates are becoming a secondary consideration.

Clinical Methods. By ROBERT HUTCHISON, M.D., and HARRY RAINY, M.D. Fourth Edition. Pp. xv., 632. London : Cassell and Company Limited. 1908.—This volume is so well known that it requires little comment. Having reached its fourth edition, the whole work has been revised and brought up to date. There are many additions and some alterations. The book is one which we think should be in the hands of every clinical clerk.

Physical Signs of Diseases of the Thorax and Abdomen. By JAMES E. H. SAWYER, M.D. Pp. xi., 188. London : Baillière, Tindall & Cox. 1908.—The methods of examining the physical signs in the lungs, heart and abdomen, are carefully described in this book, and tables of differential diagnosis of several diseases are included. As the book is written for medical students, we think it a pity that the author has not made it more extensive by including all the physical signs which a student is required to note when taking a case. For example, the physical signs of the nervous and some other systems are not described. Perhaps in a second edition the utility of the book may be increased by extension in scope.

Studies in Blood Pressure. By GEORGE OLIVER, M.D. Second Edition. Pp. xii., 255. London : H. K. Lewis. 1908.—The second edition of this little book has been considerably enlarged, and contains in a small space a very large amount of most useful clinical experience. The author, having reason to suppose from his observations that the blood pressure readings obtained by the armlet method were in many cases erroneous, has used his hæmo-dynamometer with, he believes, more accurate results.

This instrument is designed to balance the blood pressure in an artery, not to close it. Arterio-sclerotic conditions being those which more particularly interfere with a true estimation of the systolic pressure, the author recommends the use of his instrument in these states. Chapters written in a practical style are devoted both to the treatment of supernormal and subnormal arterial pressure.

Electric Ions and their Use in Medicine. By STEPHANE LEDUC. Translated by R. W. MACKENNA, M.A., M.B., Ch.B. Pp. vii., 70. London: Rebman Limited. 1908.—This little book gives a short summary of the theory and practice of electrolysis as applied to therapeutics. Professor Leduc, who, as the translator observes, is a pioneer in this matter, devotes three chapters out of the six into which the book is divided to a general account of the theory of electrolytic dissociation. They are marked by extreme lucidity and succinctness, and will be found especially useful to those whose recollection of these subjects is becoming somewhat hazy. The remainder of the book is devoted to the practical applications of the ionic condition of matter to medical purposes. There appears to be no doubt that considerable penetration of the tissues can be effected by making use of positive or negative ions, and the main practical point is to use suitable appliances, and to be accurate in the details of the technique. In some cases Dr. Leduc, like most enthusiasts, proves that we can be sure of eating our cake and also having it, as in the application of glycerine of carbolic acid instead of a watery solution. Surely the fact that dissociation hardly takes place at all in the former, besides rendering it a non-caustic application, also diminishes its antiseptic effect. In the treatment of certain nervous and cerebral disorders, it seems likely that Dr. Leduc's methods are no better than others which are less elaborate and costly; but for the local application of drugs through the unbroken skin, electrolytic dissociation appears to be a useful and effective condition. The book is fluently translated, and in a short appendix the translator has added a few notes on various practical therapeutic points.

Introduction to Dermatology. By NORMAN WALKER, M.D., F.R.C.P. Fourth Edition. Pp. xvii., 332. Edinburgh: William Green & Sons. 1908.—The principal addition in the fourth edition of this well-known work consists of colour-reproductions of casts made for the author by Dr. Cranston Low. The value of the book as a guide in dermatology is undoubtedly increased by such representations of actual diseases, more particularly since nomenclature in skin diseases is passing through a stage of complete transition. How ready the author is to welcome a more rational nomenclature may be judged from his definition of eczema as "the term commonly applied to any wet

or scaly inflammation of the skin, of the cause or nature of which the observer is ignorant." He continues: "To those who know nothing, or next to nothing, of the diseases of the skin, most eruptions are eczema. The greater the observer's experience, the more diseases can he differentiate from eczema, and the fewer remain to be so called." Of pityriasis he says, "The use of the simple term is merely a pedantic method of concealing ignorance." As regards vaccine treatment we quote his opinion in full: "If I have damned the vaccine treatment of acne with faint praise, I am ready to make amends in connection with sycosis. I have seen cases, which I have treated in vain with all the other methods, improve so strikingly under injections of vaccine prepared from cultures of their own staphylococci that, so far as concerns sycosis, I am prepared to shout with the loudest of the vaccinists." Although the book is no more than an introduction to the subject, it teaches one how to approach a skin disease with a view to diagnosis and treatment, and cannot fail also to have some influence in shaking off the yoke of the past, and freeing dermatology from its mediæval superstitions and its heritage from the leechdoms.

Reports of the Society for the Study of Disease in Children. Vol. VII. Session 1906–7. London: J. & A. Churchill.—The present volume fully maintains the standard of interest which has been shown by its six predecessors. The index, which is very carefully and exhaustively compiled, shows the large number of rare and interesting cases which are annually brought before the Society, especially in the department of infantile deformities and congenital abnormalities. The Wightman Lecture, given last year by Dr. Frederick Taylor, is a valuable contribution to our knowledge, and an excellent example of the exhaustive and accurate methods of its author. The relative incidence of lobar and lobular pneumonia in children is very carefully discussed, and the prognosis in each form considered in detail. A short but suggestive review of the treatment is also given. Dr. Taylor's lecture will no doubt become a *locus classicus* for future writers on this important subject. There is also an interesting discussion on Rickets by various leading authorities, and other valuable contributions include a paper on "Nephritis in Infants," by Dr. George Carpenter; one on "Cerebro-spinal Meningitis," by Dr. Edmund Cautley; and two on "Various Aspects of Rheumatism in Children," by Dr. C. O. Hawthorne.

Our Baby. By Mrs. J. Langton Hewer. Eleventh Edition. Pp. viii., 168. Bristol: John Wright & Sons, Ltd. 1908.—Though elementary in character, this book will be found quite comprehensive enough for all practical purposes. The chapters on diet and bottle-feeding are especially good,

though a great many now advocate a higher percentage of milk for bottle-fed babies at birth than that recommended in food-table. We think the idea of describing in detail the preparation of peptonised milk, raw meat juice, albumen water, bread jelly, &c., a good one, for medical men are apt to overlook such details of cookery. The dress, food, exercise, sleep, and accidents and illnesses of children, are all described in this book minutely. It would certainly be advisable if in future editions such drugs as potassium bromide, recommended for excitable children, were eliminated from the chapter on medicines as liable to grave misuse. Altogether, we believe that this little book will nail many "old wives' fables" to the counter.

Annual Report of the Board of Regents of the Smithsonian Institution for the Year ending June 30th, 1906. Washington: Government Printing Office. 1907.—There are fewer papers on medical topics than usual in this year's report, the only one being on "Zoology and Medicine," by Raphael Blanchard, and a most interesting and suggestive paper it is. There are several communications on electrical subjects, including a paper by Madame Curie on "Modern Theories of Electricity and Matter." To the general reader we would recommend papers on "Iceland: its History and Inhabitants"; and two papers on the "Rôle of Chemistry in Painting," and on "Oils, Varnishes and Mediums used in the Painting of Pictures."

Lectures on Babies. By RALPH VINCENT, M.D., B.S. Pp. viii., 113. London: Baillière, Tindall & Cox. 1908.—The preface to this small volume informs us that its contents consist of lectures delivered at the Infants' Hospital. A perusal of it leaves us in some doubt as to the class of audience to whom they were delivered. Much of the matter is far too sketchy and elementary in character for an audience of medical men or even medical students. For instance, the account of the pathology of rickets is far too superficial, and the notes on such matters as hypertrophic stenosis of the pylorus (so-called), the absorption of food, and the composition of milk, are almost in the style of "every mother her own doctor." On the other hand, if the lectures were delivered to an audience of nurses, surely it was very out of place to include such things as the formulæ for olein, palmatin and stearin, the terminology of the summer diarrhœa of infants, and the question as to operation for a contracted pylorus, which are either incomprehensible to those not having special scientific training or are beyond the scope of ordinary nursing work. The chapter of most interest is that in which Dr. Vincent describes the model dairy and milk laboratory of the Infants' Hospital; for although there is nothing very new in the details, as far as can be gathered from the short descriptions given, it is always satisfactory

to know that these institutions can be efficiently worked in spite of the hostile criticism to which they have been subjected in some quarters. The book would have been much improved had the colloquial lecture style been modified to suit the conditions of printed matter. There are several minor inaccuracies to be noted. The author, for instance, fails to distinguish between precipitation and coagulation, between the reaction of the intestinal wall and the intestinal contents, or between pyloric spasm and hyperplasia of the fibrous and muscular tissues. We are, too, at a loss to conjecture how "atrophy" can etymologically mean "loss of function." Dr. Vincent objects to the term "epidemic" diarrhœa on the ground that babies suffering from this disease do not communicate it to other babies when in hospital. On parallel lines enteric fever might be removed from the list of epidemic diseases and placed among local intestinal affections.

Some of the Clinical Aspects of Pneumonia. By DONALD W. C. HOOD, C.V.O., M.D. Pp. viii., 117. London: John Bale, Sons & Danielsson, Ltd. 1907.—The substance of clinical lectures and demonstrations, delivered by the author at the West London Hospital to postgraduates, forms the basis of this book, which is full of ripe clinical experience and sound common sense. The author deals fully with the different clinical aspects of the disease in its very various manifestations, and in order to make his points more clear, describes actual cases which have come under his own observation. He has some interesting remarks to make in his last chapter, which deals with the principles of treatment, on the somewhat vexed question of the administration of alcohol in this disease.

Nodal Fever (Febris nodosa). By ALFRED AUSTIN LENDON, M.D. Pp. vii, 90. London: Baillière, Tindall & Cox. 1905.—The synonyms Erythema nodosum and Erythema multiforme are a sufficient explanation of the disease which Dr. Lendon wishes to nominate as above. He looks upon the malady as an acute specific infectious fever, rather than an affection of the skin, as has commonly been taught. An analysis of some sixty-three cases, studies for the most part in Adelaide, has convinced him that erythema nodosum is preceded and attended by pyrexia with general signs of malaria, that its course is marked by a prodromal period, by a stage of eruption, and by a period of convalescence; and that it occurs under conditions which strongly suggest infection from one case to another. He gives much evidence in favour of this view, but does not quite eliminate the rheumatic element or convince us that some other than the rheumatic germs are the cause of the disease.

Editorial Notes.

University College Colston Society.

The Tenth Annual Dinner of this Society was held on what was last year designated as Founder's Day, January 14th, 1909, under the Presidency of the Principal of the College, Professor C. Lloyd Morgan, LL.D., F.R.S. The distinguished guest of the evening was Sir Arthur W. Rücker, M.A., D.Sc., M.D., F.R.S., late Principal of the University of London, who was supported by the Right Hon. the Lord Mayor of Bristol, Mr. Edward Robinson, J.P.

This Society was founded in 1899 for the purpose of perpetuating the memory of Edward Colston in connection with the promotion of higher education in this city, and it is now felt that the time has come when it is desirable that a portion of the funds of the Society may be used for the purpose of furthering the Bristol and West of England University scheme.

The President, in proposing "The Pious Memory of Edward Colston," said that others from that chair had laid stress upon the large sums that Edward Colston had expended in the furtherance of education, and he could not but think that Mr. George Wills's announcement a year ago from the presidential chair of the University College Colston Society of the promise of £100,000 towards the foundation of the University of Bristol would have been regarded by Edward Colston as furthering the welfare and the well-being of the citizens of Bristol. If this University of Bristol were not going to further the welfare and the well-being of the citizens of Bristol, it would certainly fail to fulfil the aims and aspirations of its promoters. He was often asked, "What will the University of Bristol be, and what will it do?" He thought the obvious answer—if in some respects a somewhat enigmatical answer—was that it would do, and would be, that which the citizens of Bristol determined that it should be and it should do. Bristol had to show the educational stuff of which it was made. It had before it a great opportunity. It had to

show clearly that it was equal to the responsibilities of one of the first cities in Great Britain. No one had done more for the establishment and maintenance of Universities than the guest of the evening.

Sir Arthur Rücker, in the course of his speech, said he considered the present time to be a most interesting period in this question of University affairs in Bristol—just as the sun was rising, and had not yet risen. In his address on the subject of "University Extension," he remarked that the duties of a University might be summed up in three main points. In the first place a University had to diffuse knowledge—it had to teach. In the second place it had to add to knowledge—it had to investigate. Thirdly, it had to produce that academic spirit, that fine flower of cultivation which was so easy to recognise, but so hard to define, but was not necessarily produced either by great learning or great investigation. In all these matters the new Universities had a hard problem to solve. In teaching the rank and file of their students they had to choose between compelling them to face an examination in many of the subjects which everyone who professed to be educated must know something of, or to insist only on a more competent knowledge of a few. If they did the first they ran all the risks of fostering a system of cramming; if the second, they were sure to be accused of leaving out something which, in the opinion of enthusiasts, was of vital moment. His own opinion was that of two evils it was better to choose too few subjects than too many, and it was better to aim at teaching a man how to learn—that was, to teach himself—than to aim at teaching him, or, what was worse, examining him on, everything that everybody thought he ought to know.

Professor Rücker further spoke on the mutual interaction of the University and the city in which it was situated. He believed this connection between the University and the town would be twice blessed. It would benefit the town by directing the attention of students to the industries of the town, but it would also benefit it by establishing in its midst an outward and visible sign of its appreciation and care for things which had not always

a direct commercial value, but which were as essential constituents of the greatness of a community as trade itself. Success in commerce might lead a great community to success in literature and science—had they not already had their Ramsay?—and success in literature and science would lead to that further quickening of civil life which might again vivify and increase the commerce from which it sprang.

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Queen Victoria Jubilee Convalescent Home.

An interesting meeting was held on February 5th, under the chairmanship of Sir Herbert Ashman, for the purpose of reviewing the work of this highly successful Institution during the nine years of its life. The statistics given by the Treasurer, Mr. Philip H. Vaughan, on his 80th birthday, are of much interest, and are worthy of careful perusal.

In the nine years of the existence of the Home the average yearly receipts were £2,750, the average yearly cost was £2,558, and the average cost of food was £985. The average number of patients passing through the Home each year was 1,432, and the average number in the Home every day in the year was 67. The average stay was 17¼ days, and the average increase in weight of patients was three pounds. The total receipts were £24,766 15s. 8d., the total cost was £23,020 16s. 2d., leaving a balance of £1,745 19s. 6d. Out of that balance there was paid back to capital £400 borrowed in 1900, and, in addition to that, £1,000 was set aside for special repairs. There remained £345 19s. 6d. either in the bank or in the hands of the matron. The food cost of every patient in 1901 was £15 9s. 3d., and in 1908 £14 8s. 6d. The total cost per patient per year in 1901 was £42 12s., and in 1908 £36 10s. 3d. He thought few institutions could show a better result. The average cost per year per patient for the nine years was £38 8s. 3d. At the present time the total cost of the food per patient per month was £1 5s. 3d., or a weekly cost of 6s. 3d.

The question was raised by the Rev. Dr. Glover as to the need

in Bristol of a Home for Incurables, a question demanding grave consideration and unbounded generosity.

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Home for Incurables.

THE desirability of such a Home is constantly present with those who take a part in the management of our medical institutions for the poor. Such a Home should be partially self-supporting, as it should be designed for those who are able to pay something for their maintenance. The incurable consumptive is, perhaps, the class of incurable in most urgent need of such provision. No sanatorium admits cases which are obviously beyond the range of recovery, and yet such cases should be carefully guarded against the risk of contamination of others. We cannot do otherwise than cordially commend to philanthropists the idea of endowing a Home for all classes of incurable invalids.

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Schoolboys and long runs.

THE question as to whether it is desirable or otherwise that boys of school age should be encouraged to take part in cross-country runs and races has been raised by recent correspondence appearing both in lay and medical contemporary publications, and more particularly by definite statement in a letter signed by four eminent physicians and a surgeon, "that school and cross-country races exceeding one mile in distance are wholly unsuitable for boys under the age of nineteen, as the continued strain involved is apt to cause permanent injury to the heart and other organs."

It is, of course, open to every medical man to form an opinion on such questions, and to give expression to his views; but we cannot help feeling that when a number of eminent medical men append their signatures to a statement, unless it is beyond reasonable controvertion, the grounds upon which their opinion is formed should be stated. It seems curious that cross-country runs should be regarded with suspicion by a goodly number of medical men and a larger proportion of parents, unless there is

some solid basis for their objections. On the other hand, it is noteworthy that those medical men, who on such questions may be regarded as experts on the subject of exercise for boys, namely the medical officers to those Public Schools where such healthy forms of exercise are the custom, should see no reason for modifying the practice of the schools in respect to runs. Far from it: those who are best entitled to speak from particular experience appear to be unanimous in their approval of cross-country runs, and it would seem very curious if English schoolboys had to abstain from a perfectly natural form of exercise.

One naturally asks why running *a priori* should be bad for boys—should involve such a strain on the heart as has been suggested. Sprinting, which involves very rapid motion, during which breathing is very inefficiently performed, probably does throw a good deal of strain on the right heart; and in quarter or half-mile hurdle races, in which the breath is held as a rule when each hurdle is taken, this is certainly likely to put a strain on the heart. But in long races a boy has to go fairly steadily, and it is not a question of strain so much as physical endurance on the part of the central nervous system; and although a boy, if he is not in good training, may become over-exhausted, there is no reason—provided his heart is organically sound—why it should be in any way injuriously affected, even should temporary exhaustion result from undue enthusiasm on the part of the runner. Undoubtedly far greater strain to the heart may be produced by excessive gymnastic exercises, as in climbing high ropes or working on the horizontal bar. No one would blame football as a game because a boy whose heart was unsound increased the unsoundness by taking part in a game for which he was physically unfit; and although without proper medical supervision such boys would be most unsuited for cross-country races, and certainly liable to suffer from taking part in them, it would surely be absurd to try and earmark running as dangerous on account of the indiscretions of a few. Our experience, at any rate, has been that even long cross-country runs of nine miles in length may be run by boys under the age of nineteen, after proper medical supervision, without any risk of harm resulting, and we think it would

be most deplorable that schoolboys should be brought up with the idea that Nature has not prepared them with necessary strength for this perfectly natural form of exercise.

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Milk.

THE meeting of the Society on February 10th was devoted to a discussion on various points connected with milk, and abstracts of the various papers occupy a large part of this number. The papers will speak for themselves, but we have received the following "Impressionist Report of this meeting by a G.P.," whose views will receive much sympathetic consideration from our readers. He writes:—

"In an unguarded moment I wandered into this meeting to hear, as I hoped, an illuminating discussion on a topic I had thought one of the most innocent—to wit, milk. At the time of entering, our able and esteemed M.O.H. was discoursing of infant mortality (in respect of which it appears that Bristol has about the lowest record), and the influence thereon of that popular infantile drink, milk. After emphasising the importance of supervision of the distributing of that commodity, to which all heartily assented, he went on to condemn the use of raw milk unreservedly. He compared the use of it with raw meat, and insisted on the necessity of using the cooked article. Here there seemed, to me at least, ample scope for opposing opinion, *e.g.* Dr. Clement Dukes. There followed next an admirable address from our City Analyst, Dr. Russell, demonstrating the frequency of adulteration and dilution of milk, and the ridiculous inadequacy of the penalties imposed. Here again one heartily agreed, though it might be with a shudder at the possible delinquencies of one's own supplier. Then followed the *pièce de résistance* in the form of a paper from Professor Walker Hall, which was certainly one of the ablest and most strenuous addresses I have heard. It was, however, also one of the most terrorising. He demonstrated in a most convincing and masterly manner that milk, instead of being one of the blandest and most beneficial of foods, was a mixture of nameless horrors and the most virulent

potentialities; that it was blended, vended, and bought with a criminally callous or an ignorantly indifferent disregard of the most obvious precautions; that to Pasteurise it, or to boil it (except for an hour on two consecutive days)—a task which staggers the imagination in these rushful days—was but to impair its bactericidal powers, whilst only destroying some of the moderates in the bacillic microcosm, and leaving others of the more virulent and irreconcilable free to work their wicked will. Of these and many other things of an equally unassuring character the Professor discoursed, incidentally giving the *coup de grace* to the much exploited and advertised claims of the lactic acid ferment therapy of commerce. His admirable paper made one feel one had done well to spend here a short hour of detachment from the strenuous course of outside daily life. At the same time, one felt some astonishment that so many, nourished on this death-dealing fluid, still survived to learn of its condemnation. Next spoke our venerated President, who, criticising our tendency to run sheep-like after each new theory, good or bad, devoted his short time to the task of deprecating the free use of milk, either in health or disease. In a few authoritative words he disposed of the accumulated custom and experience of all the ages, to say nothing of medical usage as obtaining during the life history of veterans like myself. Milk, it seemed, contained too much water (and the speaker was referring to the natural, unwatered product), too little of proteids, insufficient calorific material, and left too large an intestinal residue to be disposed of to be useful as a diet, except for a very short period. For elderly persons it appeared to be deadly; for typhoid cases it was simply disastrous; in renal cases, whether acute, subacute or chronic, its harmfulness was merely a matter of degree; in gastric ulcer it was hardly a less death-dealing agent; in pneumonia (and consequently in cases of heart weakness), to rely on it was only to have the unfortunate experience of him of "the pierced hand," who had leaned on the broken reed. Having shattered many of one's most cherished and firmly established beliefs as effectually as possible in the brief time at his disposal, the President gave

way to his successor. Broken and dispirited, I meditated immediate flight, but temporised for a while. Then Dr. Rogers arose, and began to expound—or so it seemed to my disturbed mind—the horrors that lurked in the fluid supplied first-hand from mother to child; and I left, not standing on the order of my going. The total effect produced on one's mind, so far as it can be briefly summed up, seemed to be that to brave the perils of drinking milk is as parlous as to face the poisoned arrows of the Pigmies or the Mausers of the Boers, and requires either a profound and perhaps enviable ignorance, or a happy combination of optimism and fatalism. *In medio tutissimus ibis.*"

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Resignation of Editorial Secretary.

THE title-page of this number of our *Journal* contains a change which deserves recognition. Mr. James Taylor, who has now resigned the office of Editorial Secretary, has done ten years of steady and faithful work, and has thereby earned the gratitude of the Editorial Committee and of the Society. He has been at all times eager to further the interests of the *Journal* and the Society, and has spared himself no pains in endeavouring to improve the financial position of the *Journal*, which but for the persistent efforts of its Secretary would not be a commercial success.

The Editorial Committee is glad to welcome Dr. J. A. Nixon, who has undertaken to carry on the work of Editorial Secretary, and they trust that the members individually will facilitate his work by giving him all the assistance in their power.

Notes on Preparations for the Sick.

Calomel Cream; Roboleine; Pulverettes.—OPPENHEIMER, SON & Co., London.—The **Calomel Cream** has been prepared at the suggestion of Colonel Lambkin, who has given it an extensive trial, and finds good results from its use by hypodermic intramuscular injection. It is issued in aseptules containing the dose of fifteen minims, is absolutely sterile and causes no pain or local irritation. It contains five per cent. of Calomel.

Roboleine is a combination of fresh calf bone-marrow, with the expressed extract from ox ribs, and cream of malt with hypophosphates of lime, soda and potash. It is quite palatable, and its results are believed to be superior to those derived from cod liver oil and malt extracts.

Pulverettes have been designed as an improvement on the ordinary pill or tablet. They have a frail chocolate and sugar coating, but are easily crushed between thumb and finger. They are readily dissolved, and it is obviously impossible that they could pass through the alimentary canal and remain entire, as not unfrequently happens with coated pills, tablets and even gelatine capsules. A long list of drugs is now available for use in the form of Pulverettes. The makers claim that they are absolutely accurate in weight, and may be looked upon as a British pharmaceutical triumph.

Iodival : A monoiodisovalerianyl urea. **Digipuratum :** Extractum Digitalis depuratum.—KNOLL & Co., Harp Lane, E.C.—**Iodival** is an organic preparation containing 47 per cent. of iodine. This drug passes through the stomach unchanged; but in the intestine, in the presence of sodium hydrate, it enters into solution as a sodium salt. The liberation of iodine from this sodium salt proceeds gradually, so that it takes some days for all the sodium to be given off. The action of the iodine, therefore, lasts for several days, and will be of use in cases of syphilis, arterio-sclerosis, asthma, &c.

Digipuratum is a preparation of digitalis uniform in action and stable in composition, whose activity has been physiologically attested. It is put up as a powder corresponding in strength to powdered digitalis leaves, and also in tablet form, each one being equal to 0.1 grm. of digitalis leaves. As a rule, four tablets on the first day, three tablets on the second and third days, and two tablets on the fourth day, half an hour after meals, are sufficient. If a pronounced effect is secured on the second day, two tablets will suffice for the third day.

Important Arylarsonates.—BURROUGHS, WELLCOME & Co., London.—Striking clinical results are said to have been obtained with the new arylarsonates, known under the trade-mark names of "Soamin," "Kharsin" and "Orsudan."

In the treatment of syphilis, sleeping sickness, malaria and other protozoal diseases the low toxicity of these salts enables physicians to administer comparatively large quantities of arsenic without any toxic effects.

"Soamin" (**Sodium Para-aminophenylarsonate**) is stable, uniform in action, is soluble in about five parts of water, and gives a neutral solution which can be sterilised. It contains 22.8 per

cent. of arsenium in organic combination, and has less than $\frac{1}{40}$th the toxicity of arsenious acid. Results of the administration of "Soamin" in cases of syphilis demonstrate the great therapeutic value of this agent.

"Kharsin" (Sodium 3—methyl 4—aminophenylarsonate) is soluble in two and a half times its weight of water, and gives a neutral solution. It contains 23.7 per cent. of arsenium, and is about equal in toxicity to "Soamin."

"Orsudan" (Sodium 3—methyl 4—acetylaminophenylarsonate) is soluble in three times its weight of water, and gives a neutral solution. It contains 25.4 per cent. of arsenium, and is the least toxic of the three salts. It has proved by recent clinical trials to be of marked value in malaria.

The arylarsonate salts should not be given by the mouth, as they are broken up by the acid contents of the stomach, and the effects of over-treatment by arsenic are thus more easily produced. Freshly prepared solutions should be administered by sub-cutaneous or intra-muscular injection, preferably the latter.

"Soamin" should not be used simultaneously with mercury, nor administered until fifteen days after mercurial treatment has ceased.

These drugs have yet to establish themselves. They appear to pass through the body unchanged, and it is doubtful whether their action is due in any way to the arsenic which they contain in so large a quantity.

New "Tabloid" Hypodermic Preparations.—BURROUGHS, WELLCOME & Co., London.—The following combinations are now issued:—

"Tabloid" Hypodermic, No. 121.

Atropine Sulphate	gr. 1.200
Strychnine Sulphate ..	gr. 1.100

"Tabloid" Hypodermic, No. 122.

Atropine Sulphate	gr. 1.150
Strychnine Sulphate ..	gr. 1.80

These preparations are of service in the treatment of inebriety and narcomania. The hypodermic administration of small doses of atropine and strychnine for a few weeks has been found to create a repulsion for alcohol which is more or less lasting in character.

Elixir Lactopeptine.—RICHARDS, 46 Holborn Viaduct, E.C.—Each fluid ounce represents:—

Lactopeptine, gr. 38, with alcohol 19 per cent.

One of the uses of this palatable combination is to disguise the disagreeable properties of other drugs such as sodium

salicylate, chloral hydrate, antipyrin, ergot, the iodide and bromide salts, &c.

Autan ; Guaiacose.—THE BAYER COMPANY, Elberfeld and London.—Autan is designed for the convenient application of formaldehyde to disinfection by fumigation. Practically no apparatus is required, there is no risk of fire, no difficulty of storage or transport, skilled labour is unnecessary, and many simultaneous disinfections can be carried out.

The method consists in the mere addition of water to Autan as a means of evolving formaldehyde and steam. The original package and a pail are the only apparatus required. It has been recently awarded a medal by the Royal Sanitary Institute, and it is in use largely by corporations, shipping and railway companies, &c.

Guaiacose (Liquid Guaiacol Somatose).—This combination should be of great use in the treatment of respiratory diseases, more particularly pulmonary tuberculosis. It needs no commendation, as a combination of the well-known Somatose with Calcium-Guaiacol-Sulphonate (a tasteless and odourless form of Guaiacol), in liquid form with an agreeable flavour, cannot fail to be of use to the doctor and his patients.

Tannismut.—E. W. BLASIUS, London.—This chemical combination of bismuth with tannic acid is made by the Von Heyden Company, of Radebeul, Dresden. It is said to be the most efficacious remedy in all forms of diarrhœa: one molecule of tannic acid splits off more readily than the other, and hence the astringent action may extend along the entire length of the bowel. It is more agreeable to the taste than its name would imply. Why is it necessary to invent such ill-sounding and meaningless appellations? We have found it to be of some use in a case of prolonged mucous colitis, in which the ordinary preparations of bismuth and many other drugs have been of no effect.

The Library of the Bristol Medico-Chirurgical Society.

The following donations have been received since the publication of the List in December:

February 27th, 1909.

L. M. Griffiths (1)	93 volumes.
Medical Officer of the London County Council (2)	1 volume.
The Pathological Society of London (3)	1 ,,
The Surgeon-General, United States Army (4) ..	1 ,,
J. Taylor (5)	1 ,,

SEVENTY-FIRST LIST OF BOOKS.

The titles of books mentioned in previous lists are not repeated.

The figures in brackets refer to the figures after the names of the donors, and show by whom the volumes were presented. The books to which no such figures are attached have either been bought from the Library Fund, or received through the *Journal*.

Barr, T. and J. S. *Diseases of the Ear* .. .. 4th Ed. 1909
Bennett, Sir W. *Injuries and Diseases of the Knee-Joint* 1909
Bland-Sutton, J. *On the Position of Abdominal Hysterectomy in London* 1909
Brunton and L. Rogers, Sir J. Fayrer, Sir L. *On the Poison of Venomous Snakes* 1909
Burghard, F. F. [Ed.] *A System of Operative Surgery.* Vol. I. .. 1909
Buzzard, I. B. Yeo, R. Crawfurd, and E. F. *A Manual of Medical Treatment.* 2 Vols. .. .. 4th Ed. 1909
Catalogue (Index-) of the Library of the Surgeon-General's Office, United States Army. 2nd Ser. Vol. XIII. (4) 1908
Cazenave et H. E. Schedel, A. *Abrégé pratique des Maladies de la Peau* .. .. (1) 3me Éd. 1838
Civiale [J.] .. *Traité pratique sur les Maladies des Organes génito-urinaires.* 3 Vols. .. .. (1) 2me Éd. 1842–50
Crawfurd and E. F. Buzzard, I. B. Yeo, R. *A Manual of Medical Treatment.* 2 Vols. .. .. 4th Ed. 1909
Dawson, E. R. *The Causation of Sex* 1909
Dupuytren [G.] *Leçons orales de clinique chirurgicale.* 6 Vols. (1) 2me Éd. 1839
Fayrer, Sir L. Brunton and L. Rogers, Sir J. *On the Poison of Venomous Snakes* 1909
Jordan, F. .. *Surgical Enquiries* .. .. (1) 2nd Ed. [N.D.]
Keen, W. W. [Ed.] *Surgery.* Vol. I–IV. 1908
Kipling, R. .. *Doctors* 1908
Lamb, W. .. *Diseases of the Throat, Nose and Ear.* .. 2nd Ed. 1909
Lawrence, W. *Venereal Diseases of the Eye* .. .. (1) 1830
Lisfranc, J. .. *Clinique chirurgicale de l'Hopital de la Pitié.* 3 Vols. .. .. (1) 1841–43
Marsden, R. W. *Infectious Disease* 1908
Meadows, B. .. *Eruptions* .. .. (1) 7th Ed. 1875
Meigs, A. V. *Milk Analysis and Infant Feeding* .. .. .. (1) 1885
Philip, F. R. .. *De Clavo secalis* .. .. (1) 1826
Ramsay, A. M. *Diathesis and Ocular Diseases* 1909
Rogers, Sir J. Fayrer, Sir L. Brunton and L. *On the Poison of Venomous Snakes* 1909
Schedel, A. Cazenave et H. E. *Abrégé pratique des Maladies de la Peau* .. .. (1) 3me Éd. 1838
Scoresby-Jackson, R. E. *Materia Medica* .. .. (1) 3rd Ed. 1875
Scott, C. E. West and S. R. *The Operations of Aural Surgery* 1909
Spencer, C. G. *Gunshot Wounds* 1908
Stoddart, W. H. B. *Mind and its Disorders* 1908
Sturges, O. .. *Introduction to Clinical Medicine* .. .. .. (1) 1873
Tanner, T. H. *Memoranda on Poisons* .. .. (1) 2nd Ed. 1862

Thorne, L. T. *The "Nauheim" Treatment of Diseases of the Heart* .. .. 3rd Ed. 1909
Wanklyn, J. A. *Water Analysis* .. .. (1) 5th Ed. 1879
Waring, H. J. *Manual of Operative Surgery* .. .. .. 3rd Ed. 1909
West and S. R. Scott, C. E. *The Operations of Aural Surgery* 1909
White, C. P. .. *Lectures on the Pathology of Cancer* 1908
White, F. F. .. *Infected Ears* 1908
Yeo, R. Crawfurd and E. F. Buzzard, I. B. *A Manual of Medical Treatment.* 2 Vols. .. .. .. 4th Ed. 1909

TRANSACTIONS, REPORTS, JOURNALS, &c.

American Journal of Obstetrics, The .. .. Vol. LVIII. 1908
American Journal of the Medical Sciences, The .. Vol. CXXXVI 1908
American Ophthalmological Society, Transactions of the Vol. XI, Pt. 3 1908
American Proctologic Society, Transactions of the 1908
American Surgical Association, Transactions of the Vol. XXVI 1908
Association of American Physicians, Transactions of the Vol. XXVIII 1908
Bristol Directory, Wright's 1909
Bristol Health Report for 1907 1908
British Medical Journal, The .. .. Vol. II for 1908
Edinburgh Medical Journal .. .. N.S., Vol. I 1908
Gazette hebdomadaire des Sciences médicales de Bordeaux Tome XXIX 1908
Hazell's Annual 1909
Hospital, The .. .. Vol. XLIV 1908
Hospitals—
Guy's Hospital Reports .. .. Vol. LXII 1908
International Congress of School Hygiene, Transactions of the Second .. .. 3 Vols. 1907
Journal of Laryngology, The .. .. Vol. XXIII 1908
Lancet, The .. .. Vol. II for 1908
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MEETINGS OF SOCIETIES.

Bristol Medico-Chirurgical Society.

December 9th, 1908.

Dr. MICHELL CLARKE, President, in the Chair.

Mr. A. L. FLEMMING read a paper on **Post-anæsthetic vomiting.** (See page 40.)

Mr. HEY GROVES read a paper on **Three Cases of Ileo-Colostomy,** in which he had performed the operation (i) for chronic mechanical obstruction, (ii) for tuberculous perforation of the cæcum, (iii) for idiopathic dilatation and atony of the colon. In the latter case excision of practically the whole colon was subsequently performed with satisfactory result, the patient being a neurasthenic, middle-aged woman. He was persuaded, from the success in these cases, that the operation was at times of great value, although occasionally the anti-peristaltic wave, which normally occurs in the ascending and transverse colon, gave rise to painful distension in the occluded portion of the bowel.

Dr. ELWIN HARRIS related the case of a woman, aged 40, the subject of obstinate constipation, who had already undergone Weir Mitchell treatment and an operation for nephropexy. He performed a right inguinal colotomy with a view to irrigation of the lower bowel, whereby she was temporarily relieved. But a sudden acute abdominal attack led to a further exploratory laparotomy, revealing a thickened, inflamed U-shaped transverse colon; nothing more was done at the time. Fæcal impaction recurred, and ileo-sigmoidostomy was performed. At first natural actions of the bowel followed, but there was no permanent improvement, and after two months fæces were again passed through the colotomy wound. Four months afterwards the greater part of the large intestine was removed, but the patient died on the second day after the operation. He was impressed by the hopelessness of permanently relieving by any operation the protean complaints of a neurasthenic.

Mr. CARWARDINE showed lantern slides prepared from **a Case of early Pregnancy** with photo-micrographs of the fœtal villi and syncytium.

Dr. WALTER SWAYNE said that the earliest human ovum studied hitherto was about the eleventh day (Bryce), and it had served to demonstrate the fictitious character of a human embryology based chiefly on the development of invertebrates.

It was interesting in connection with this case to note that one of the first specimens which upset the old idea of the formation of the decidua reflex was obtained from a case of tubal pregnancy (para-tubal hæmatocele). The tubal mucosa showed a distinct scar at the point where the ovum had penetrated the wall of the Fallopian tube, owing to the "boring" action of the trophoblast.

Dr. STACK read a paper on **Subcutaneous Injection of Paraffin,** showing several cases of restoration of the bridge of the nose.

Dr. W. KENNETH WILLS read a short note on an **urticarial rash occurring among grain-porters employed in unloading barley from an African port.** Fine vegetable hairs were found in the papules which resembled somewhat those of the "Mucuna" (cowhage), though with some microscopical differences. The rash was of a very acute nature, but seemed to yield to inunctions of a chrysarobin ointment.

January 13th, 1909.

Dr. MICHELL CLARKE, President, in the Chair.

Dr. CHARLES read notes of a case of **Fœtal Rickets** (case shown).

Dr. EDGEWORTH read a paper on the **Temporary Paralyses which may occur in cases of Arterio-sclerosis.**

Dr. PARKER read a paper on the **Causes of Transient Cerebral Paralyses.** (See p. 15.)

Dr. BERTRAM ROGERS read a paper on **Physique and our Schoolboys.** (See p. 27.)

February 10th, 1909.

Dr. MICHELL CLARKE, President, in the Chair.

The evening was devoted to a discussion on **Milk,** and the following papers were read:—

Milk from the Public Health Standpoint, by Dr. D. S. DAVIES.

The Adulteration of Milk, introduced by Dr. E. RUSSELL.

Some Impurities of Bristol Milk, based upon the Examination of 240 Specimens, by Dr. WALKER HALL.

The Milk Curdling and other Activities of the Commercial Preparations of Lactic Acid Ferments, by Dr. WALKER HALL and Dr. W. A. SMITH.

Contra-indications to the use of Milk in Disease, by Dr. MICHELL CLARKE.

Infantile Diseases and Milk Diet, by Dr. BERTRAM ROGERS.

The Heating of Milk as it affects the Nutrition and Health of the Infant, by Dr. FORTESCUE-BRICKDALE.

For an abstract of these papers see previous pages of the *Journal.*

J. LACY FIRTH,
J. A. NIXON, *Hon. Sec.*

Local Medical Notes.

University College, Bristol.—The following examinations have recently been passed :—

M.D. LOND.—C. L. Morgan.†

M.S. LOND.—C. A. Moore,† W. R. Battye.

M.B., B.S. LOND.—C. Clarke, J. M. Hammond.† *Group II :* E. R. Holborow.

M.R.C.P. LOND.—J. W. Watson, I.M.S.†

F.R.C.S. EDIN.—W. M. Bergin.†

CONJOINT EXAMINING BOARD.—*Chemistry :* R. I. Dacre. *Pharmacy :* G. H. Griffiths. *Anatomy and Physiology :* L. C. Watkins-Baker. *Medicine :* T. B. Dixon. *Surgery :* F. C. Nicholls, R. G. Vaughan.*

D.P.H. IREL.—*Honours :* Edmund J. F. Thomas.†

L.D.S. ENG.—*Dental Metallurgy :* F. J. Hayman, J. D. Melhuish, F. C. Willows, L. G. Kinnersley. *Mechanical Dentistry :* L. G. Kinnersley.

Medical Entrance Scholarship : C. C. Harrison, E. S. Sowerby (equal).

The Radium Institute.—Captain A. E. Hayward Pinch, late I.M.S., and formerly Superintendent of the Medical Graduates' College and Polyclinic, has been appointed Medical Director of this new institution. He was at one time a student and afterwards the Medical Tutor in the Bristol Medical School.

* Denotes qualification. † Former students.

Bristol General Hospital.—Charles Corfield, M.R.C.S., L.R.C.P. Lond., has been appointed Honorary Dental Anæsthetist, and Edward Emrys-Roberts, M.D., Ch.B. Vict., M.D., Ch.B. Liverp., has been appointed Pathologist.

University College, Bristol.—E. T. Glenny, M.B., B.S. Lond., has been appointed Demonstrator of Anatomy, and Edward Emrys-Roberts, M.D., Ch.B. Vict., M.D., Ch.B. Liverp., has been appointed Demonstrator of Pathology.

Handel Cossham Hospital, Kingswood.—James Young, M.D., C.M. Glasg., has been appointed Honorary Physician.

Bristol University.—At a meeting of the Committee of Bristol University, held on January 29th, it was announced that Lord Winterstoke had promised an additional £15,000 towards the University. This, with the £20,000 he had already given, makes Lord Winterstoke's contribution to the fund £35,000. A new movement in connection with Bristol University College and the proposed new University has recently been set on foot, a committee having been formed, with the Duchess of Beaufort as president, for establishing a hall of residence for women students. Contributions amounting to £775 have already been promised. For a permanent establishment some £10,000 will be needed, though for £2,000 temporary accommodation could be found.

Bristol Dispensary.—The annual meeting of the subscribers to the Bristol Dispensary was held on January 8th. The medical report showed that during the year 1908 10,957 patients had qeen treated, a considerable increase on previous years. The report added that during the year the Institution had lost the services of Dr. A. Carling, Dr. E. G. Hall, and Mr. J. B. Webb, after completing their full term of fifteen years' service, and of Dr. A. W. C. Richardson, who retired after two years' service from ill-health, and who has recently died. The Committee states that it is glad to place on record its appreciation of the good work done by these gentlemen.

Bristol Eye Hospital.—The annual meeting of the subscribers to the Bristol Eye Hospital was held on January 13th, under the presidency of the Lord Mayor. The medical report stated that during 1908 513 in-patients had been admitted, compared with 454 in 1907. The out-patients numbered 7,387, an increase of 592 on the previous year. The financial statement showed that the income falls short of the expenditure, and that the present deficit balance of the Institution was £641. In 1910 the committee hopes to celebrate the centenary of the Hospital, and although nothing definite has been decided upon, some suggested improvements in the building are under consideration.

British Medical Library Association.—At a meeting of those interested in Medical Libraries, held at Leeds on January 9th, it was decided unanimously to form an Association of Medical Libraries, and a provisional committee was appointed to draw up the constitution and rules. Professor W. Osler (Oxford) was invited to become the first president, and Dr. I. Walker Hall (Bristol) and Mr. Cuthbert E. A. Clayton (Librarian, Manchester Medical Society) were asked to undertake the duties of temporary secretaries. The following are some of the objects of the Association :—

1. Intercourse of those interested in medical library work, and the discussion of matters associated with the fostering and care of libraries.

2. Diffusion of information as to the branches of medical literature specially catered for at different centres, and as to the value of the various books and new periodicals which are issued from time to time.

3. The promotion of measures whereby a larger number of practitioners in each centre may be induced to utilise the library faculties of each district.

4. The consideration of matters connected with the present rapid increase of periodicals, publications of books, &c.

5. The opening up of better chances of advancement for library assistants. By such means there would be an inducement to parents to put their sons to such an occupation, and the librarians would be able to have better material for training.

6. The exchange of duplicate books and periodicals.

When the Association is in working order, it is hoped that a certain number of the libraries interested will join together to form a circle for the loan of their research and other literature.

Royal United Hospital, Bath.—The annual meeting of the subscribers of the Royal United Hospital, Bath, was held on January 27th. The medical report stated that during 1908 the in-patients admitted were 1,298, against 1,318 in 1907. The out-patients numbered 13,765, compared with 12,613 in the previous year. The financial statement showed an excess of expenditure over income of £1,020, which was due to a falling off in the amount of legacies. It was stated that a new building for the accommodation of the nurses was in course of erection.

The late Dr. Emily Eberle.—The honorary treasurer of "Dr. Emily Eberle Memorial Fund" has announced that the subscription list is now closed. £509 have been received, and this sum has been invested under a trust deed, and the income will be applied to the support of a bed in the Bristol Private

Hospital for Women and Children, Berkeley Square, Clifton, for the benefit of patients attending the Read Dispensary for Women, St. George's Road, Bristol.

Territorial R.A.M.C.—The 2nd Southern General Hospital, one of the twenty-three provided under the Territorial Force scheme, with its head-quarters at Bristol, has been in the process of construction during the past year, and in October last, having obtained 30 per cent. of its required strength, was recognised by the War Office.

Its function is to provide a base hospital of 500 beds, capable of considerable extension in or near Bristol, in the event of invasion. It is one of three base hospitals for the 7th District, which includes Warwickshire, Berkshire, Buckinghamshire, Worcestershire, Gloucestershire, and Oxfordshire Birmingham and Oxford being the head-quarters of the 1st and 3rd Southern General Hospitals. In Bristol the hospital will probably work in conjunction with the 3rd South Midland Field Ambulance and a Sanitary Corps, which as yet is not in being.

Unfortunately the 2nd Southern, as the other General Hospitals, has suffered from the slow and ponderous movements of the War Office and the County Associations; for after having been recognised for some four or five months, it has only just obtained temporary and very inadequate head-quarters, which it shares with the 3rd South Midland Field Ambulance, at the Drill Hall, Queen's Road, Clifton.

We hear that a movement which has been on foot for some considerable time to provide suitable quarters is slowly coming to a head, so it is possible that in the dim future suitable accommodation may be provided.

The permanent staff of the above consists of an Administrator, a Registrar, and a Quartermaster, who are as follows:—

J. Paul Bush, C.M.G., to be Administrator with the rank of Lieut.-Colonel.

H. L. Flemming to be Registrar with the rank of Major.

C. F. Walters, F.R.C.S., to be Quartermaster with the rank of Hon. Lieutenant.

The *à la suite* officers were reported in last number, Vol. XXVI, p. 380.